

# **COVID-19 Pandemic: Update, Successes, and Challenges**

**Physicians' Research Network  
June 24, 2020**

**Wafaa El-Sadr, MD, MPH, MPA  
Director, ICAP at Columbia**



# Objectives

**At the completion of this webinar, you will:**

- 1. Be informed of the current epidemiological trends of COVID-19 in NYC, the US and the world**
- 2. Understand the successful aspects of the response and how key milestones were reached**
- 3. Be able to describe the remaining challenges to responding to COVID-19 in NYC and the US**

# Outline

- **Global and local update**
- **Disparities in impact of COVID-19**
- **Responding to the COVID-19 epidemic**
  - **Challenges**
  - **Successes**
- **Spillover effects of COVID-19**
- **Summary**

# Outline

- **Global and local update**
- Disparities in impact of COVID-19
- Responding to the COVID-19 epidemic
  - Challenges
  - Successes
- Spillover effect of COVID-19
- Summary

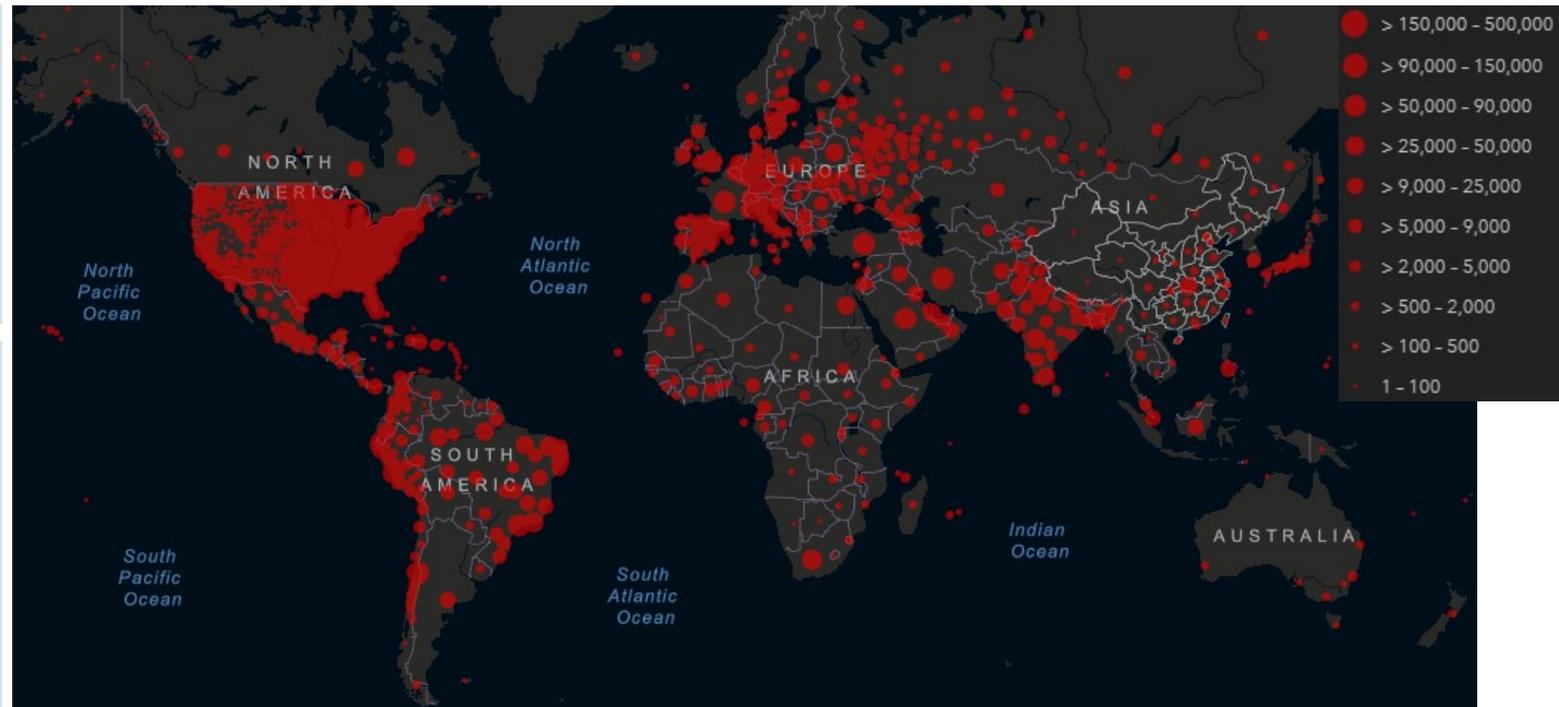
# COVID-19 Global Snapshot

## As of June 22nd:

- **8,999,645** confirmed cases globally
- **468,907** reported deaths\*
- **4,462,698** reported recoveries

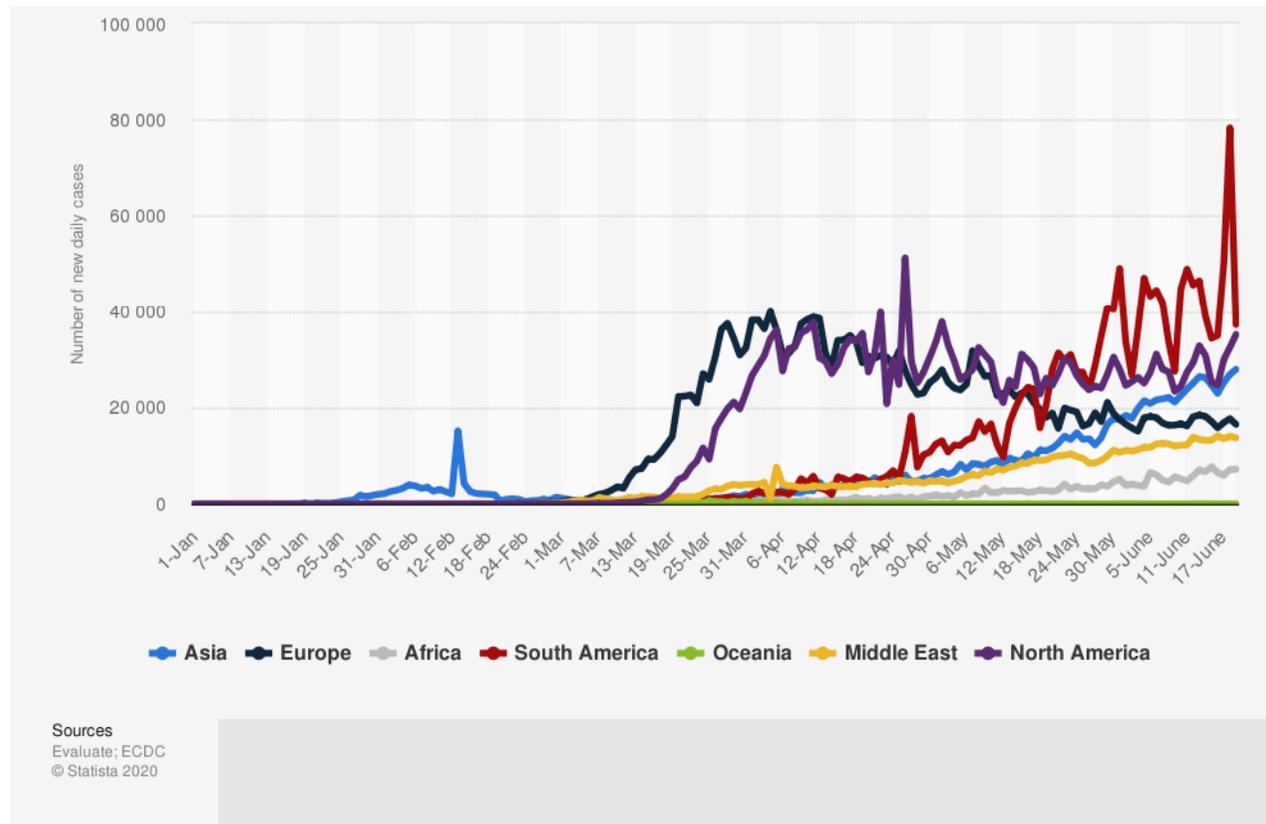
## By Region:

- **49%** in the Americas
- **29%** in Europe
- **10%** in the Eastern Mediterranean
- **7%** in South-East Asia
- **3%** in Africa
- **2%** in the Western Pacific



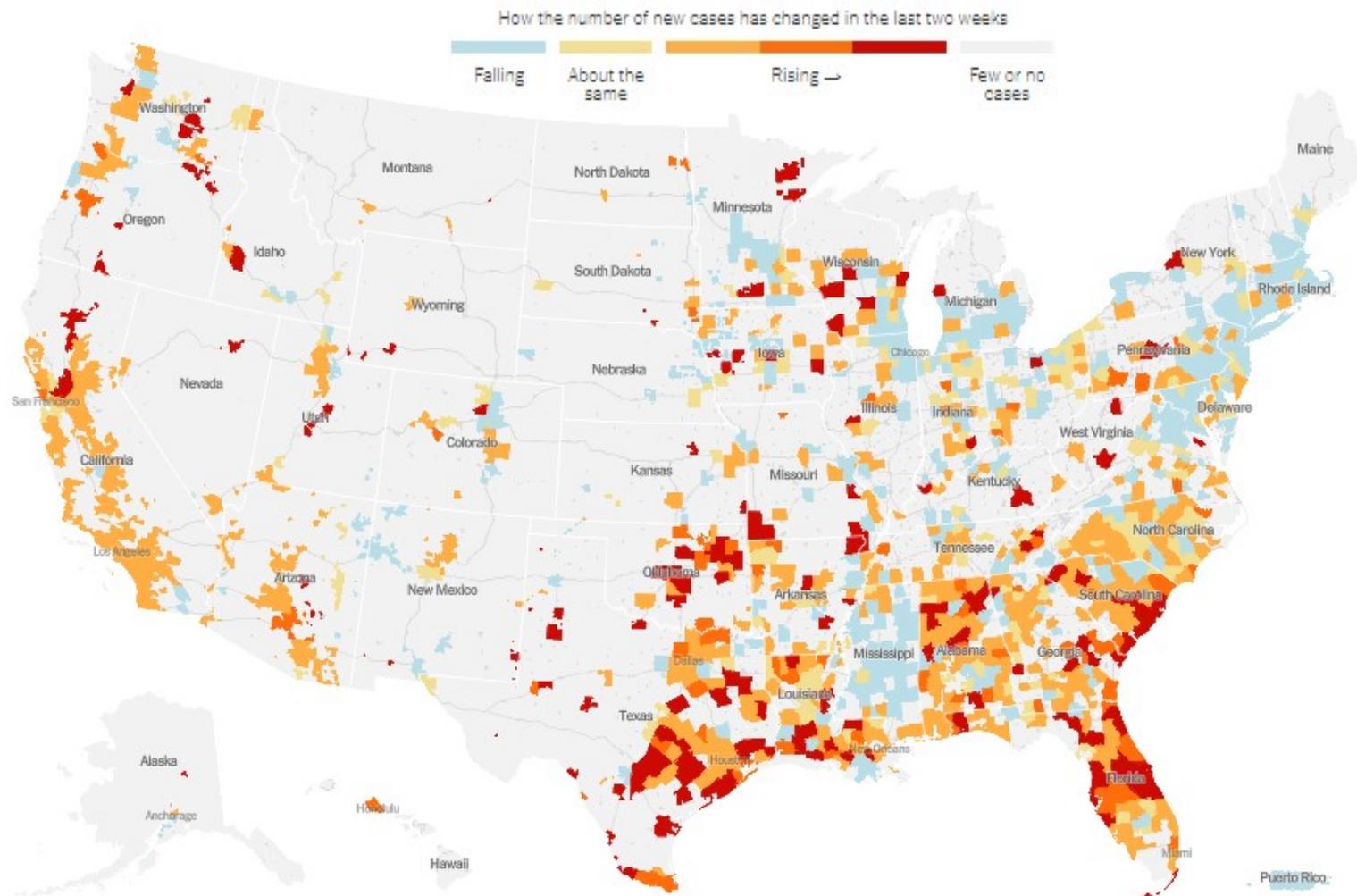
**Top five: US, Brazil, Russia, India, United Kingdom**

# Evolution of COVID-19 Pandemic: January to June 2020





# Emerging Trends in the US



Source: New York Times

# US States with increasing number of case

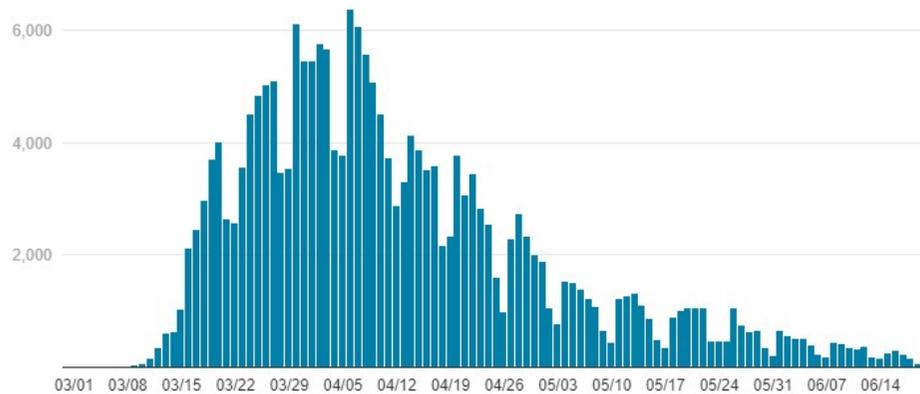


# COVID-19 in NYC

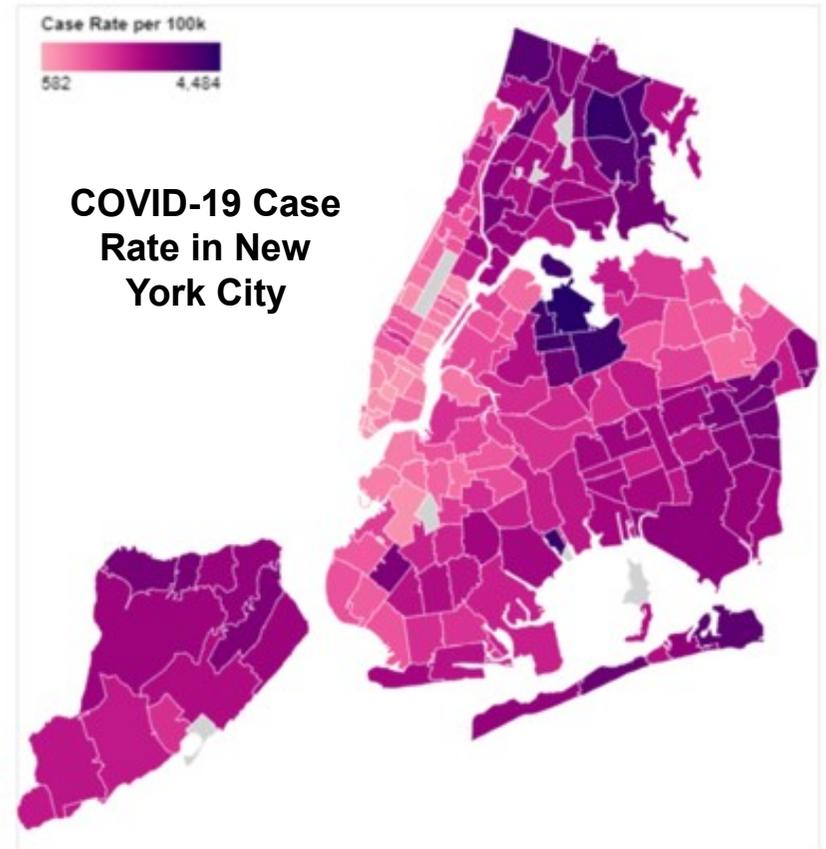
## Current Snapshot in NYC:

- 209,313 confirmed cases
  - 54% of total statewide cases
- 22,278 reported deaths\*

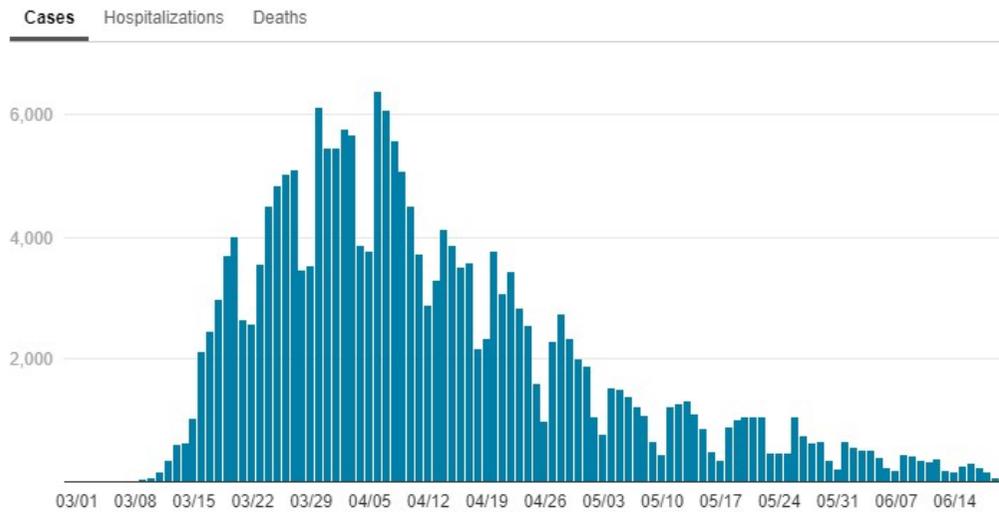
Daily Positive Cases in New York City



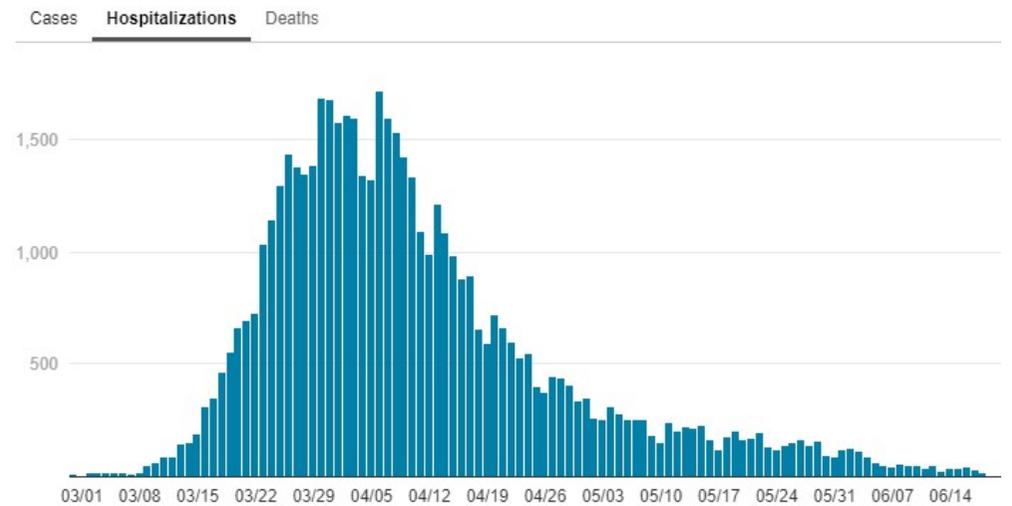
*\*Due to delays in reporting, recent data are incomplete*



# Evolution of COVID-19 epidemic in NYC-1

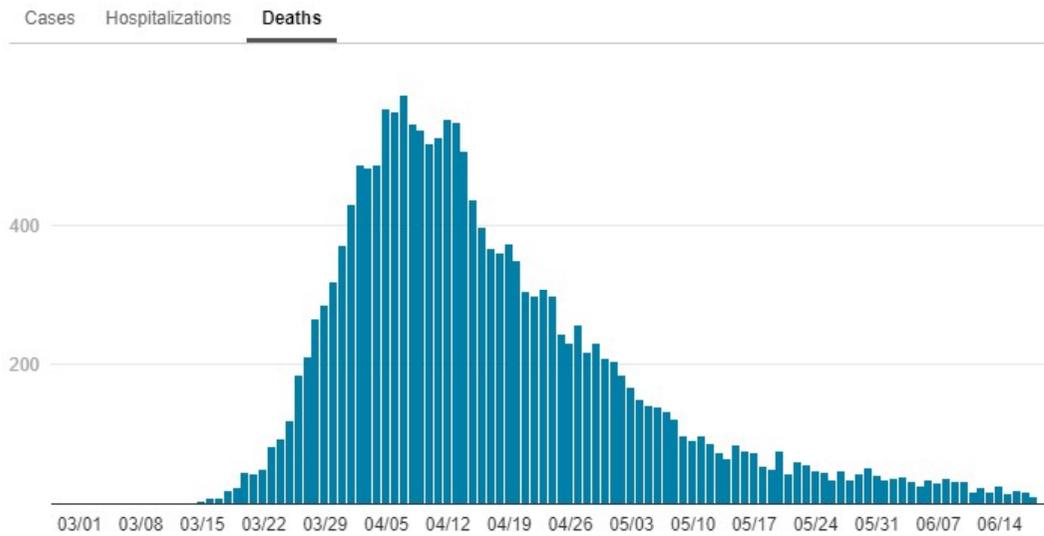


↑  
**Daily Number of Cases**

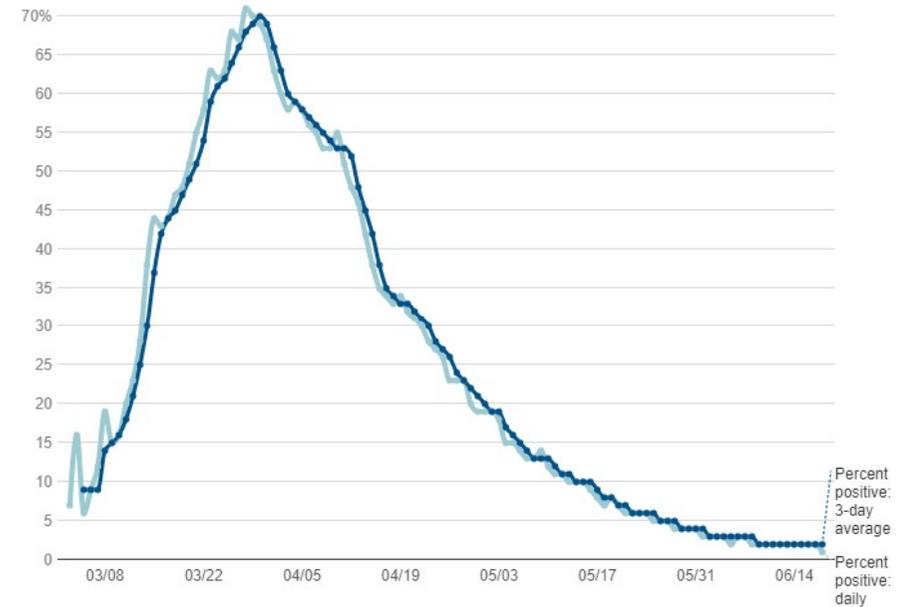


**Daily Number of Hospitalizations**

# Evolution of COVID-19 Epidemic in NYC- 2



Daily Number of Deaths



Percent Positive SARS-CoV-2 Tests

Source: NYC Department of Health & Mental Hygiene

# Outline

- Global and local update
- **Disparities in impact of COVID-19**
- Responding to the COVID-19 epidemic
  - Challenges
  - Successes
- Spillover effect of COVID-19
- Summary

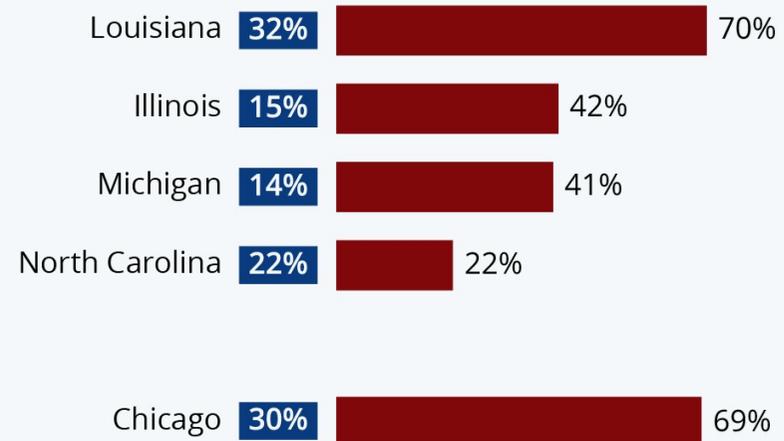
# Racial and Ethnic Disparities in the US

- **33% of hospitalized COVID-19 patients are Black/ African American,** though they constitute only 13% of the U.S. population

## COVID-19's Devastating Impact On African Americans

African American share of state/city populations and COVID-19 deaths (as of Apr 06, 2020)

■ Share of state/city's population ■ Share of COVID-19 deaths



Sources: 2010 Census, respective state/city health departments

# Racial and Ethnic Disparities in NYC

- Data show that **Black and Latino people are twice as likely** to die from COVID-19

Age-adjusted rates of lab-confirmed COVID-19 non-hospitalized cases, estimated non-fatal hospitalized cases, and total persons known to have died (lab-confirmed and probable) per 100,000 by race/ethnicity group

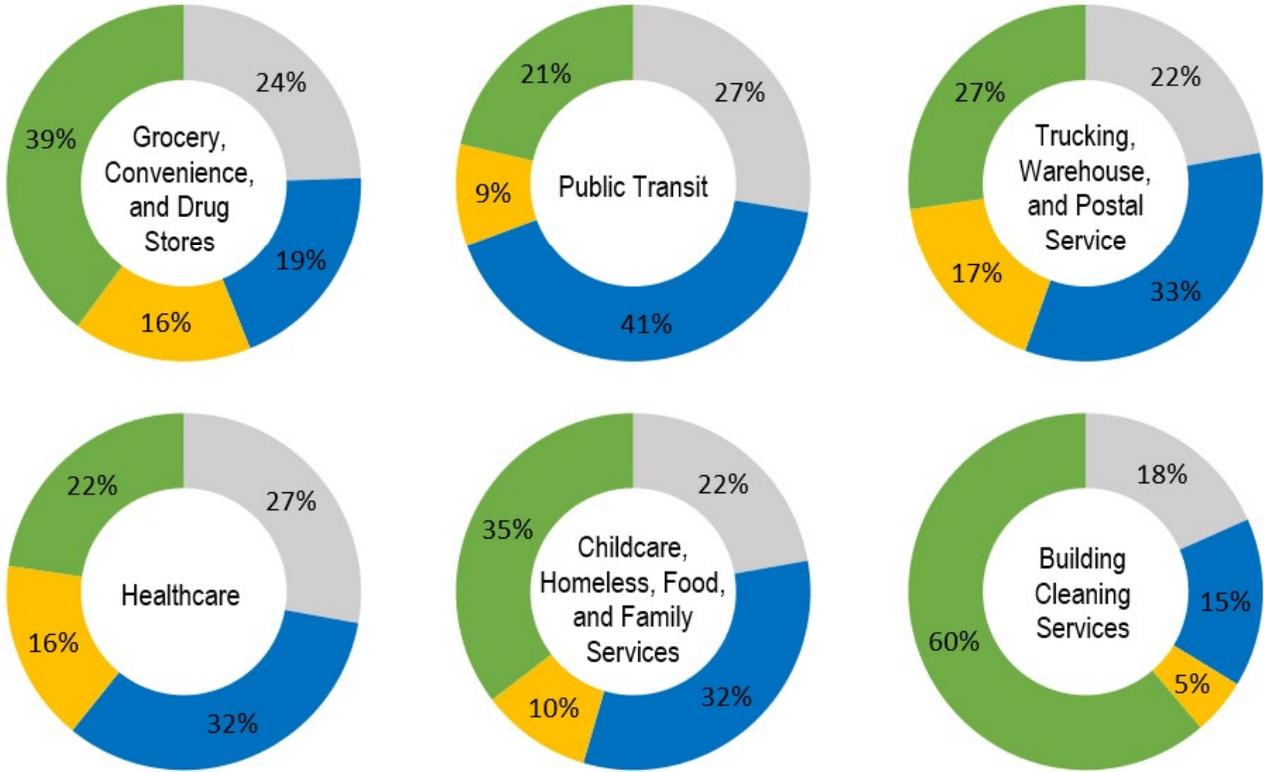


Source: NYC DOH (Visual as of May 15, 2020)

# Race and Ethnicity and Essential Work

## New York City Frontline Workers, by Race and Ethnicity

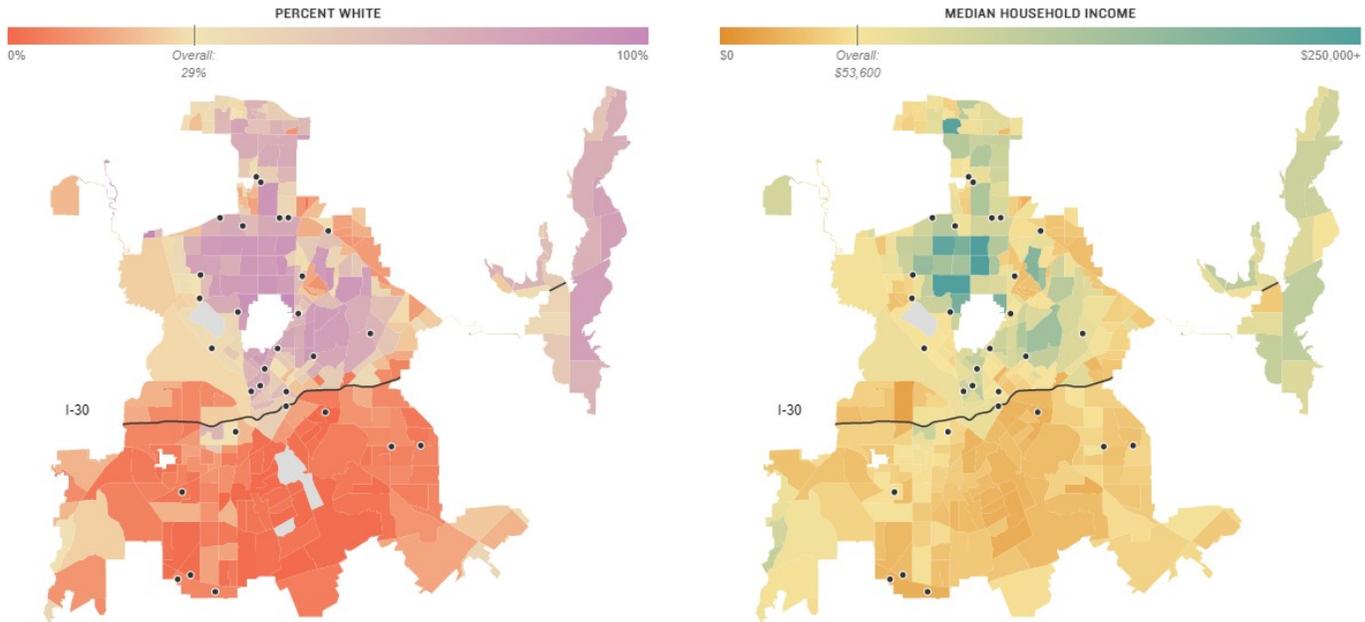
■ White ■ Black ■ Asian ■ Hispanic



Sources: NYC Comptroller (US Census), US Water Alliance

# Racial and Ethnic Disparities in COVID-19 Testing

Dallas: Testing Sites Concentrated In Wealthier, Whiter Neighborhoods



Chicago's retail testing sites leave black communities behind

Black Chicagoans are testing positive and dying at higher rates from Covid-19 than any other racial group in the city.



# Racial and Ethnic Disparities: Not a New Issue

## Decades of research have shown:

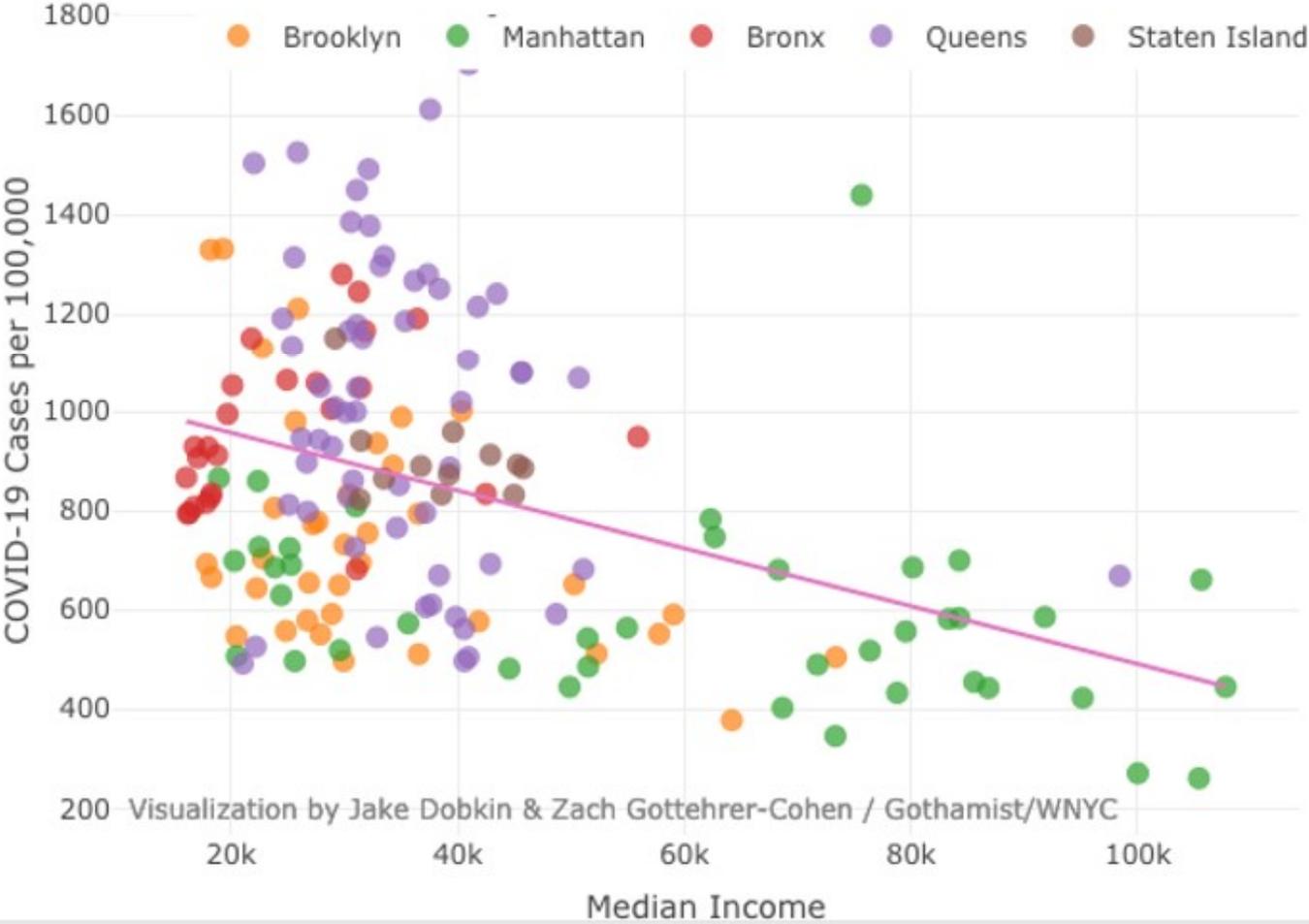
- White medical students and residents often endorse false beliefs about biological differences and **rate the black (vs. white) patient's pain as lower and made less accurate treatment recommendations.**<sup>1</sup>
- In emergency departments, non-Hispanic Blacks are **half-to-two-thirds less likely to receive opioids** for pain than non-Hispanic Whites.<sup>2</sup>
- Studies have consistently shown that Black/African Americans are less likely to get access to advanced treatments e.g. modern chemotherapeutics, transplant surgery, cardiovascular interventions.<sup>3,4</sup>

## In the case of COVID-19:

- Black patients that exhibited COVID-19 symptoms were **six times less likely to receive testing or treatment.**<sup>5</sup>

*Hoffman et al., PNAS (1), Singhal et al., PLOS ONE (2), Penner et al., Journal of Social Issues (3), Monlezun et al., Journal of Surgery (4), Rubix Life Sciences (5)*

# Income Disparities and COVID-19 in NYC



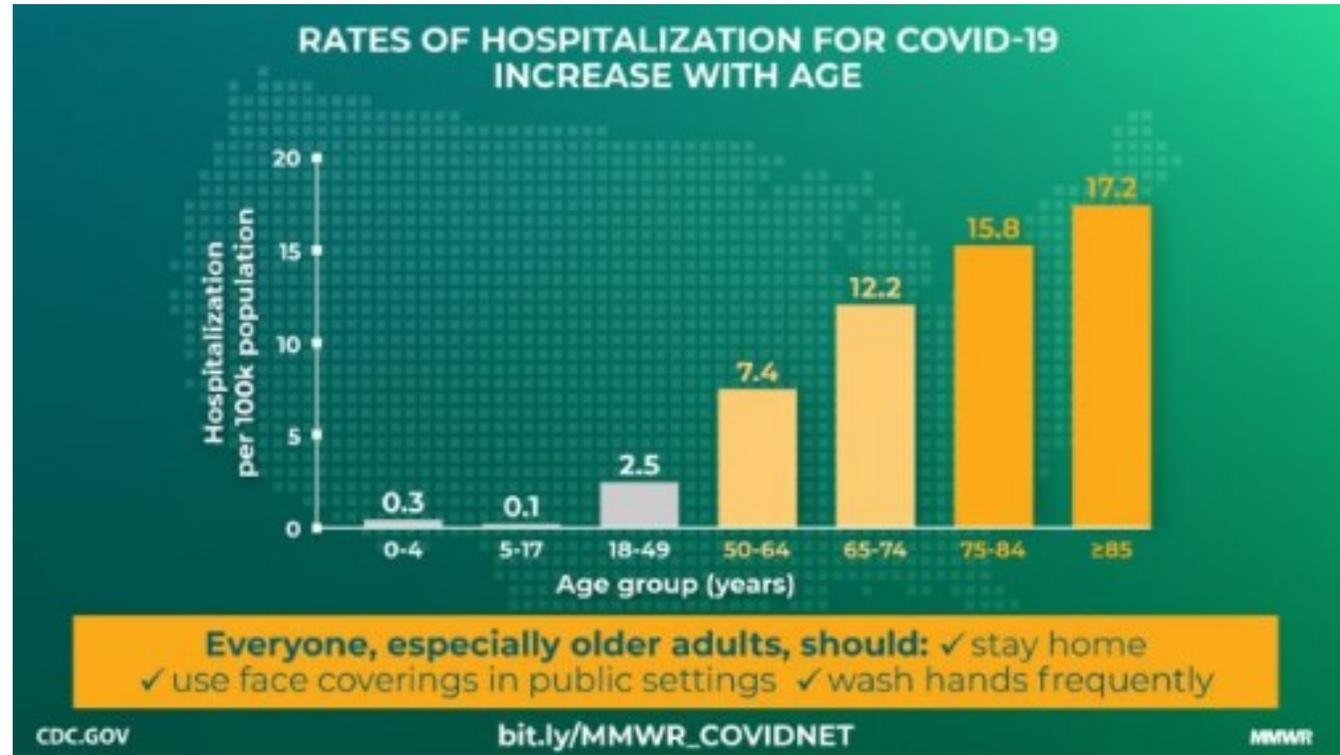
# COVID-19 Among Older Adults

## United States:

- **8 out of 10 deaths** reported in the U.S. have been in adults 65 years old and older

## New York City:

- Those 75 years and older have the **highest rates of infection, hospitalizations, and deaths** in NYC



# COVID-19 in Individuals with Pre-existing Health Conditions

## United States:

- **71% of hospitalized COVID-19 patients (n=1037) and 78% of those admitted to intensive care units (n=457) had pre-existing conditions or risk factors**

## New York City:

- **88% of hospitalized COVID-19 patients had at least 2 chronic health conditions (n=5,700)**

## COVID-19 cases based on pre-existing conditions

PRE-EXISTING CONDITION	CASES PER CONDITION Counts are among the 7,162 cases with completed information on pre-existing conditions.	PERCENT OF THOSE CASES THAT ARE:		
		NON-HOSPITALIZED	NON-ICU	ICU
Chronic liver disease	41	59%	22%	17%
Current smoker	96	64%	23%	5%
Former smoker	165	48%	27%	20%
Chronic renal disease	213	24%	45%	26%
Immunocompromised	264	53%	24%	16%
Cardiovascular disease	647	37%	37%	20%
Chronic lung disease	656	55%	23%	14%
Diabetes mellitus	784	42%	32%	19%
Other chronic disease	1,182	49%	30%	14%
One or more	2,692	52%	27%	13%
None of the above	4,470	84%	7%	2%

■ Status unknown

Source: CDC Data as of March 28, 2020 at 12 p.m. EST.

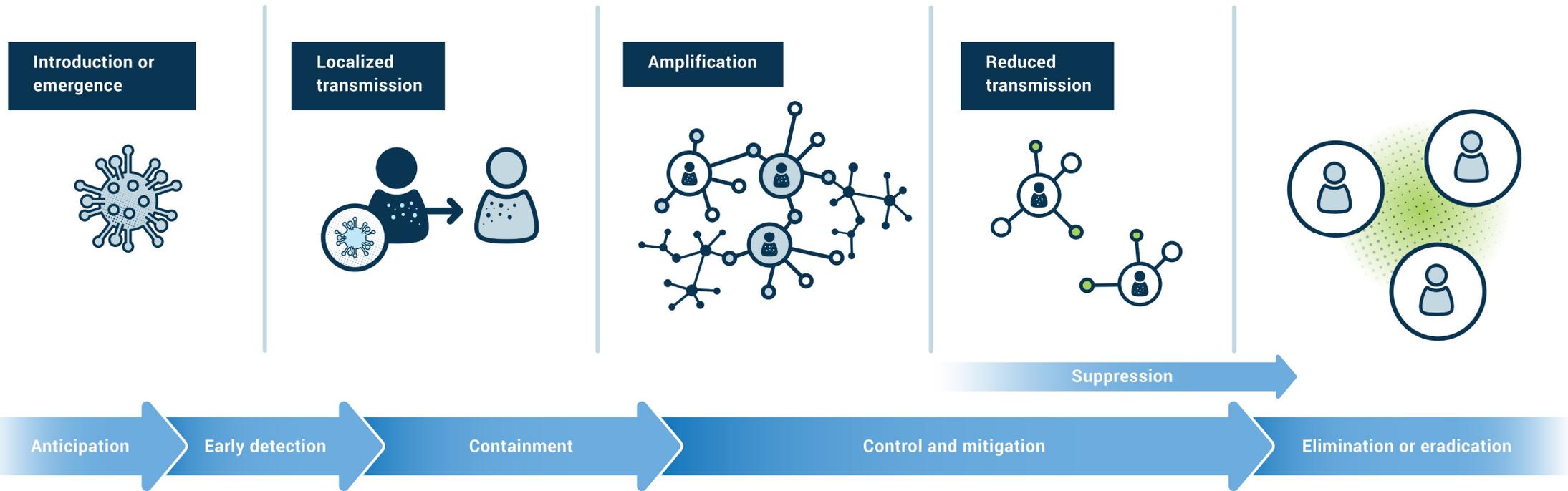
INSIDER

# Outline

- Global and local update
- Disparities in impact of COVID-19
- **Responding to the COVID-19 epidemic**
  - Challenges
  - Successes
- Spillover effect of COVID-19
- Summary

# Response Interventions

## Epidemic Phases



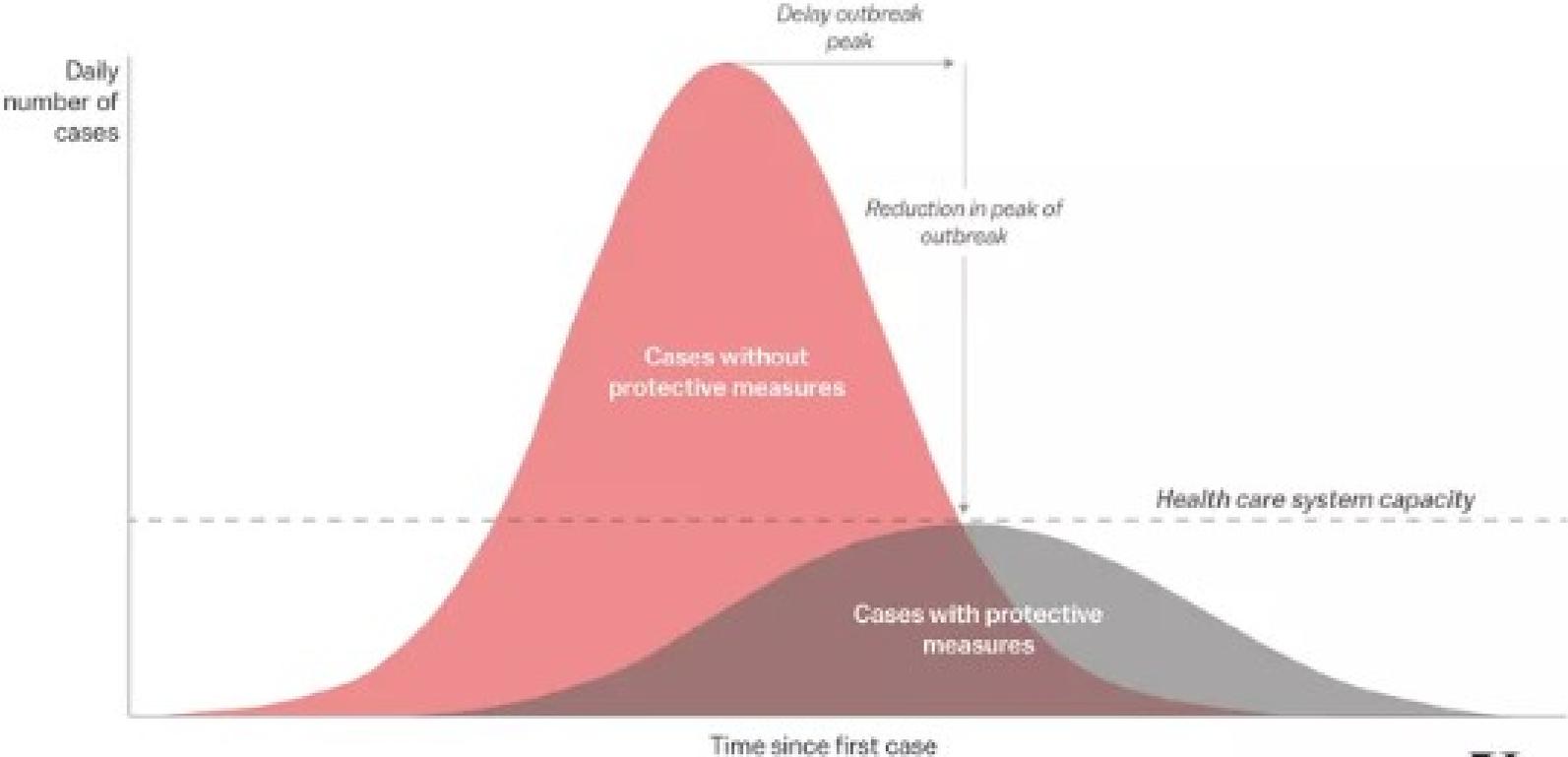
## Response Interventions

# Mitigation and Control Measures

- **Limitation on mobility**
- **Stay at home**
- **Restrictions on travel**
- **Closure of Schools**
- **Limit congregation of people**
- **Physical/social distancing**
- **Adherence to public health measures:**
  - **Face covering**
  - **Stay home if sick**
  - **Frequent hand washing or sanitizing**
  - **Cough and sneeze etiquette**
  - **Avoid touching face**
  - **Frequent disinfection of surfaces**
  - **Isolation of COVID-19 cases**
  - **Quarantine of contacts**

# The Goal

## Flattening the curve



Source: US CDC

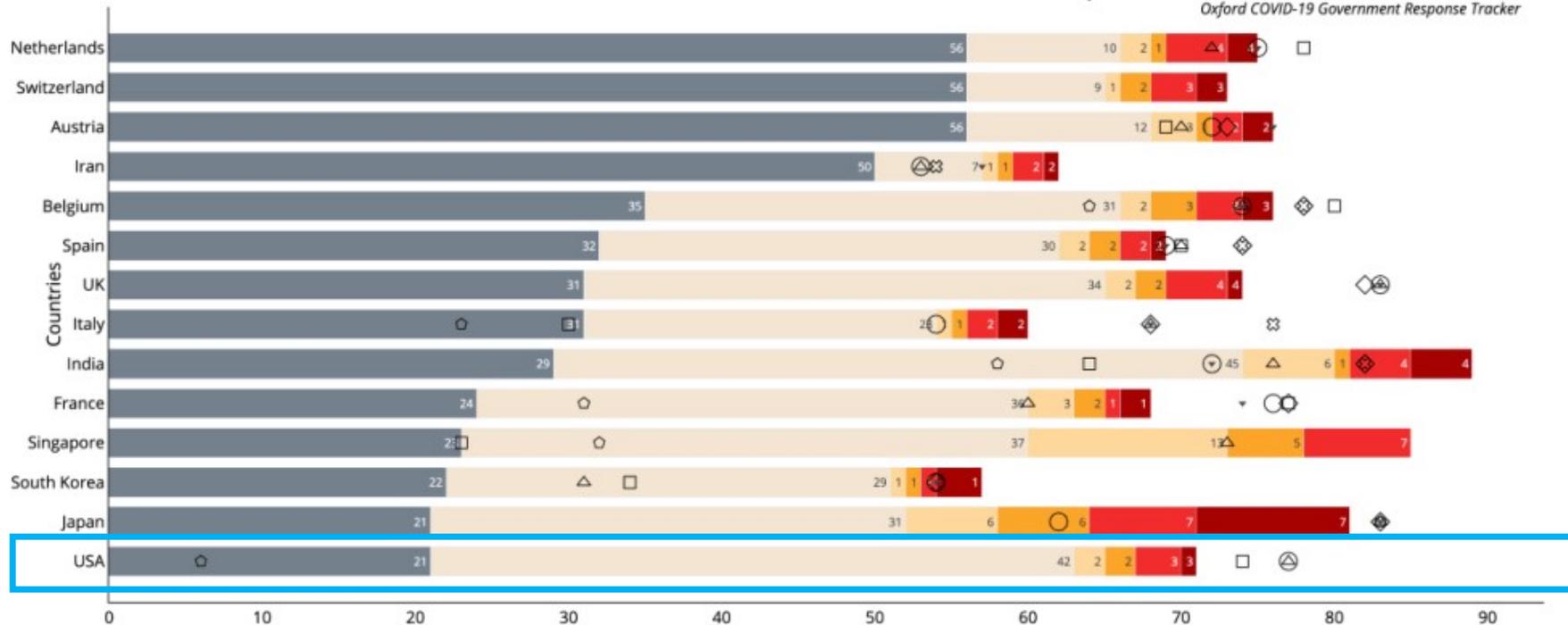
# Outline

- Global and local update
- Disparities in impact of COVID-19
- Responding to the COVID-19 epidemic
  - **Challenges**
  - Successes
- Spillover effect of COVID-19
- Summary

# Delayed national response

## TIMELINE OF COVID-19 DISPERSION AND GOVERNMENT RESPONSES

COVID-19 Data : 2019 Novel Coronavirus COVID-19, Data repository by Johns Hopkins CSSE  
 Government responses to COVID-19 : Hale, Thomas and Samuel Webster (2020)  
 Oxford COVID-19 Government Response Tracker



- Days since Wuhan outbreak to 1st case within the country
- Days from 1st case within the country to 100th case
- Days from 100th case within the country to 200th case
- Days from 200th case within the country to 300th case
- Days from 300th case within the country to 600th cases
- Days from 600th case within the country to 1000+ cases
- International Travel Control - Screening/Quarantine
- International Travel Control - Ban
- ◇ Restrictions on internal movement
- ⊗ Close public transport
- △ Cancel public events
- ▽ Workplace closing
- School closing

© Dweepobotee Brahma, Sikim Chakraborty, & Aradhika Menokee, Brookings India

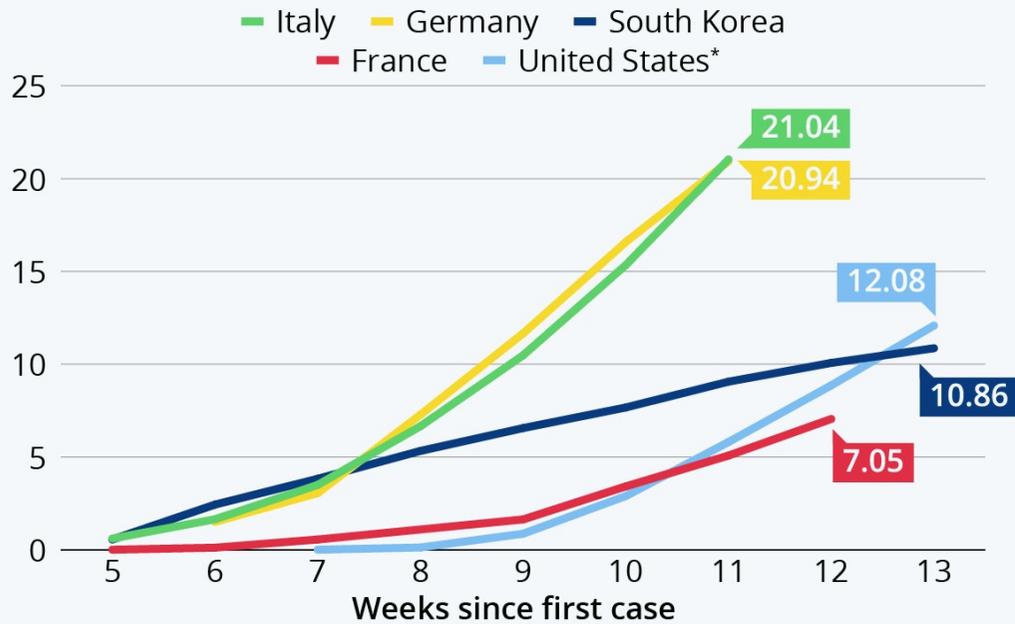
Source: Brookings



# Slow to scale-up testing

## Ramping up COVID-19 Testing?

Cumulative number of COVID-19 test administered per 1,000 population since first case detected (selected countries)



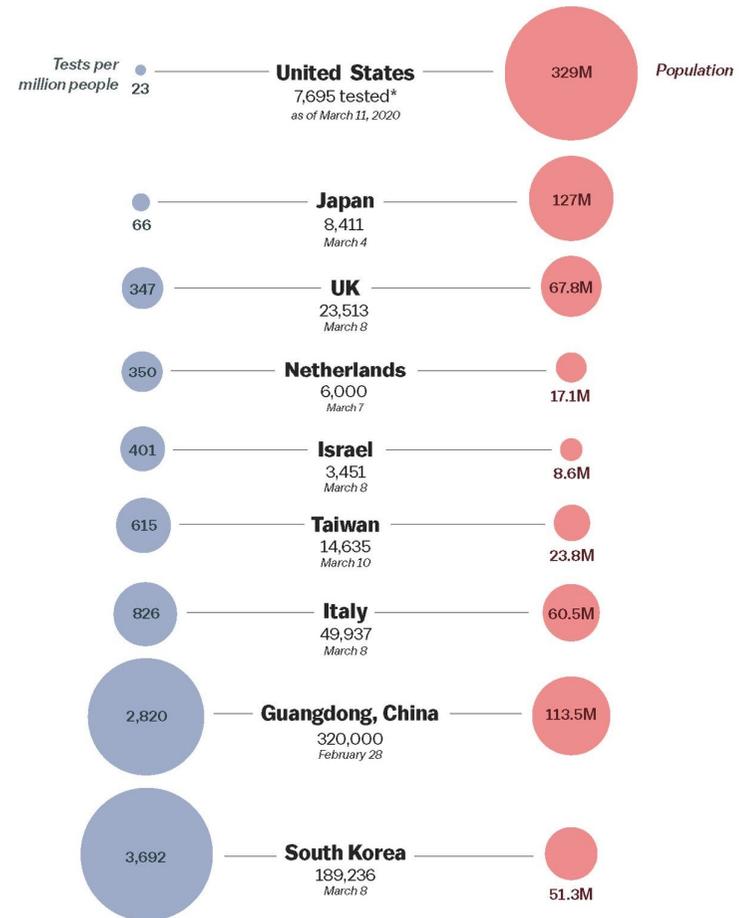
Some approximations \* estimate

Source: Official sources via Our World in Data



statista

## A snapshot of early Covid-19 testing per capita



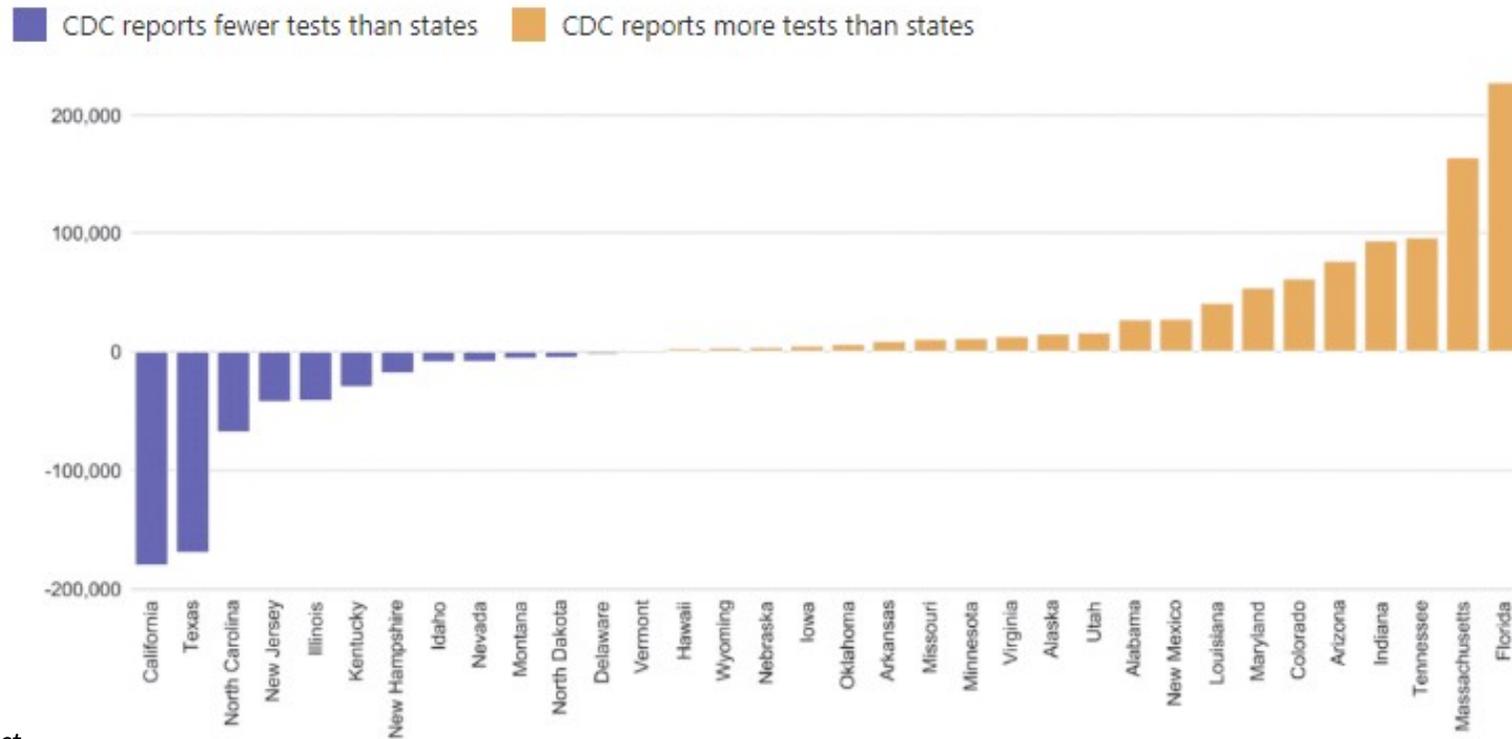
\*Test counts do not include full reporting from all US labs  
Source: Covid Tracking Project, Business Insider, the Atlantic, Taiwan CDC

Vox

# Test count discrepancies

## COMPARING STATE-REPORTED TEST COUNT DATA WITH THE CDC DATA

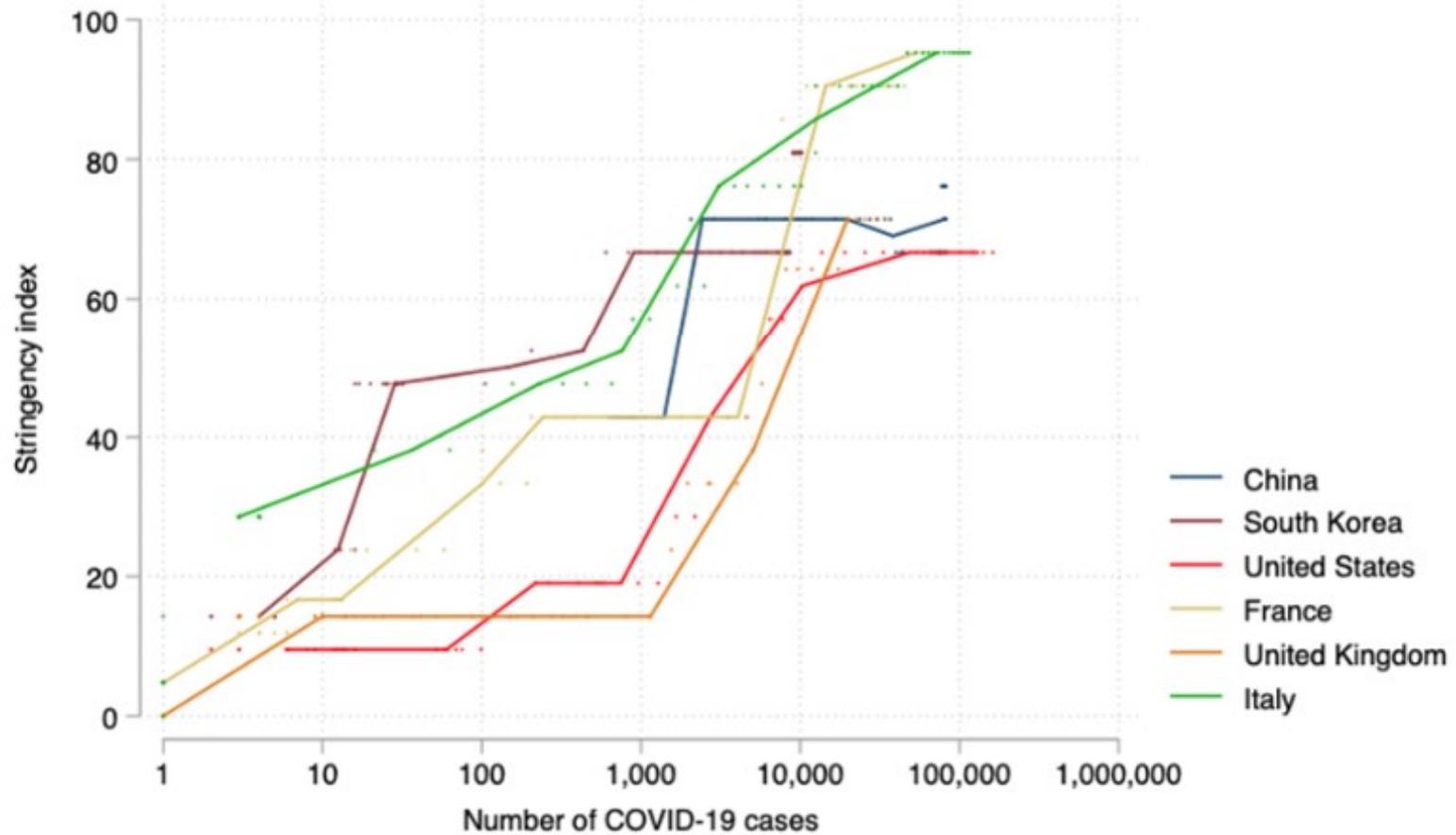
There are large discrepancies in the test counts reported by the CDC and state public health agencies.



Source: COVID Tracking Project

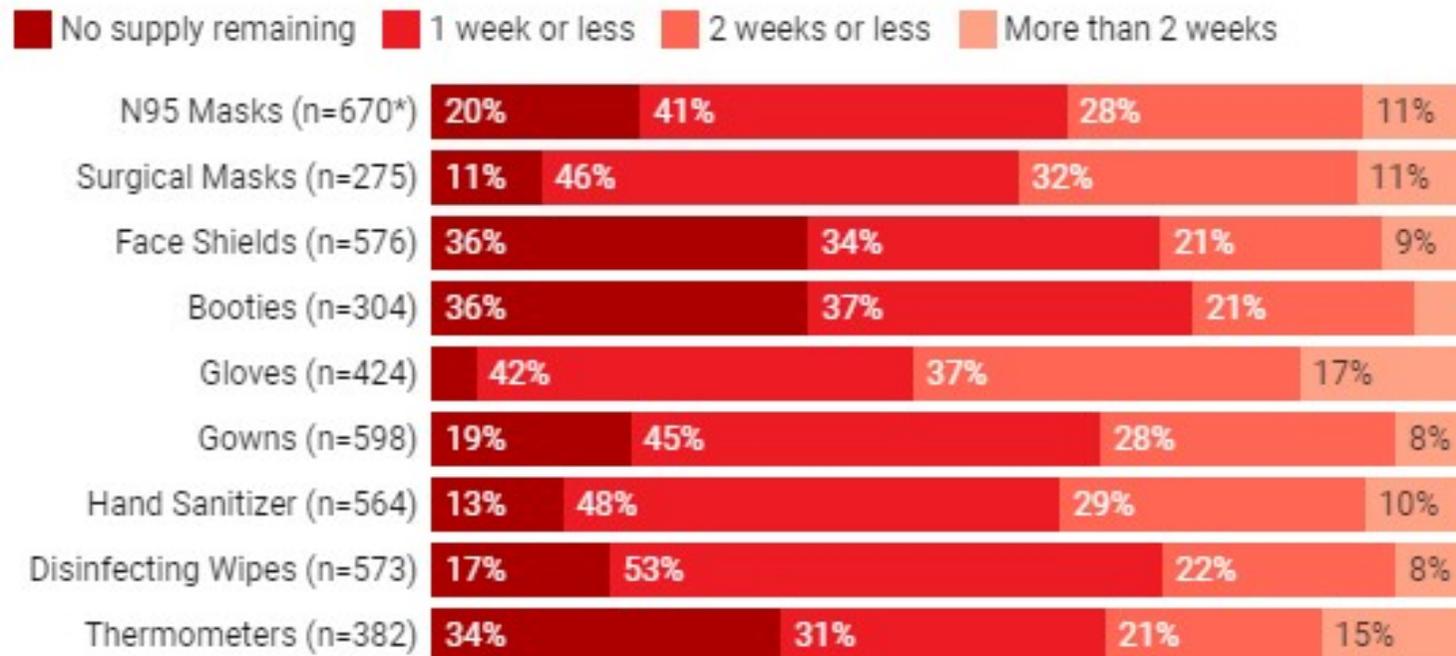
# Stringency of response

Comparison of stringency of COVID-19 response in six countries



# PPE shortages

## Supply of coronavirus PPE in health care facilities across the U.S., by type of PPE (April 8, 2020) (N=978 healthcare facilities)



Source: Time Magazine



# Challenges in measuring COVID-19 related deaths

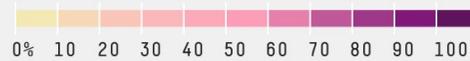
- **Current data include largely confirmed COVID-19 deaths i.e. individuals who had positive SARS-CoV-2 test and died**
- **Some municipalities/countries also collect probable COVID-19 related deaths**
- **Challenges:**
  - Individuals who died early in the epidemic prior to its recognition
  - Limited availability of SARS-CoV-2 tests
  - Individuals who die at home with unclear/undocumented cause of death
  - Individuals who die at health facility without documented test result
  - Individuals with co-morbid conditions with unclear cause of death
- **What to do:**
  - Probable cases as well as confirmed cases
  - Compare 2020 to 2019 deaths for similar periods of time

# Lack of COVID-19 Data on Racial Demographics

## Data on COVID-19 deaths often omits race

Each state's share of COVID-19 deaths for which the patient's race is unknown, as of May 6, 2020

SHARE OF DEATHS WITH UNKNOWN RACE



Data from The COVID Tracking Project as of 5 p.m. on May 6. For states that reported both race and ethnicity data, race data was used.

FiveThirtyEight

SOURCES: THE COVID TRACKING PROJECT, SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL, FLORIDA HEALTH

# Inconsistent guidance

## Trump administration rejects CDC guidance on reopening US amid coronavirus

By Nick Valencia, Betsy Klein, Kevin Liptak and Joe Johns, CNN

Updated 9:22 PM ET, Thu May 7, 2020



### CDC and WHO offer conflicting advice on masks. An expert tells us why.

*The two organizations have different takes on when to wear one.*

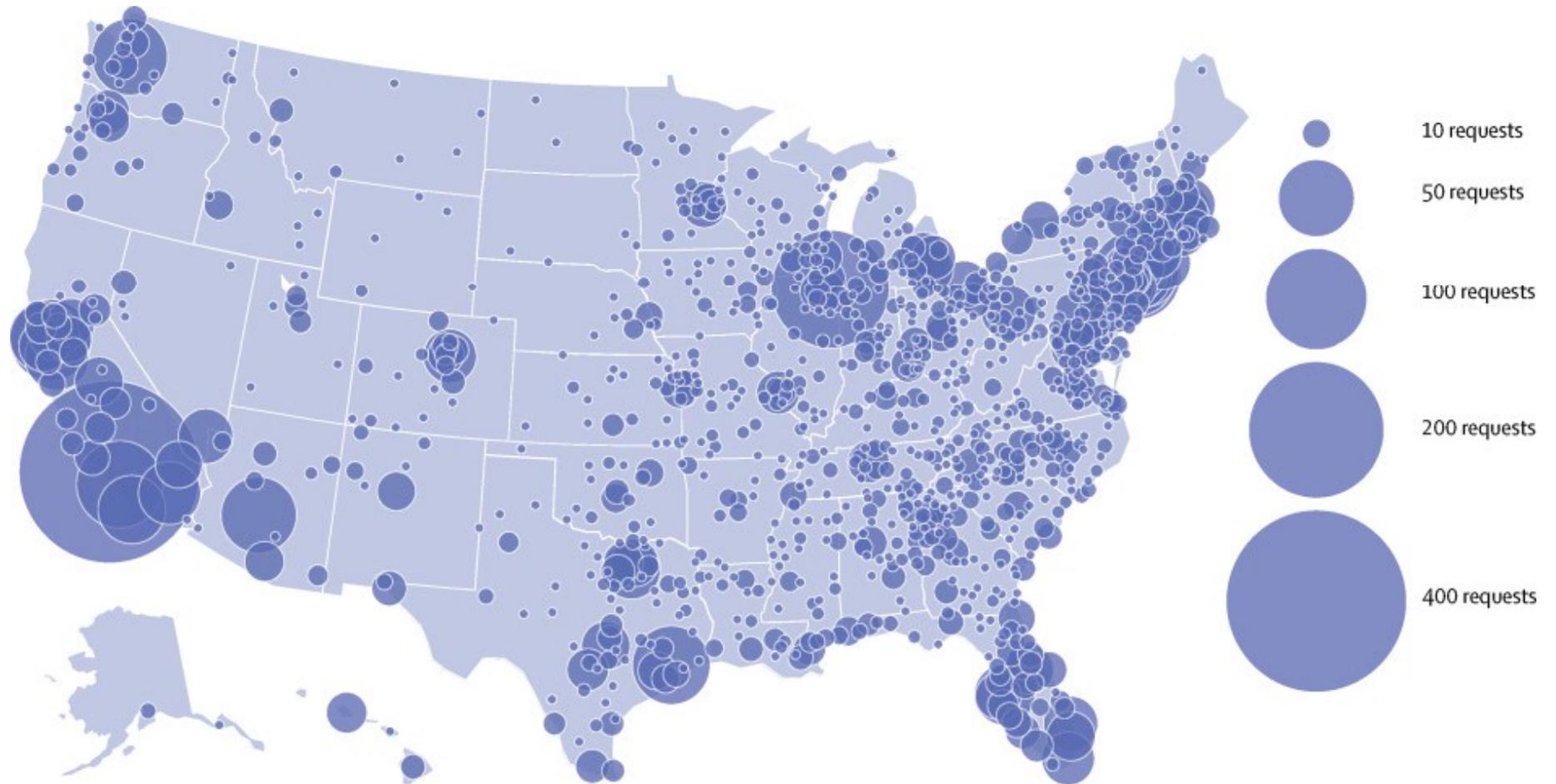
### Confusion and chaos surround coronavirus testing in the US

By Yasemin Saplakoglu - Staff Writer March 11, 2020

Sources: Live Science, CNN, ABC News

# Continued PPE Shortages

Requests for personal protective equipment by county (N=6169) (May 2, 2020)



Source: Gondi et al, Lancet

# Contact Tracing

- **COVID-19 characteristics that make it more difficult than other diseases to trace:**

 Can be transmitted before people have symptoms, so in order to prevent onward transmission from exposed contacts, contacts must be identified and quarantined immediately after case identification

 No proven effective treatments for COVID-19, making cooperation between public health officials and cases and contacts all the more important

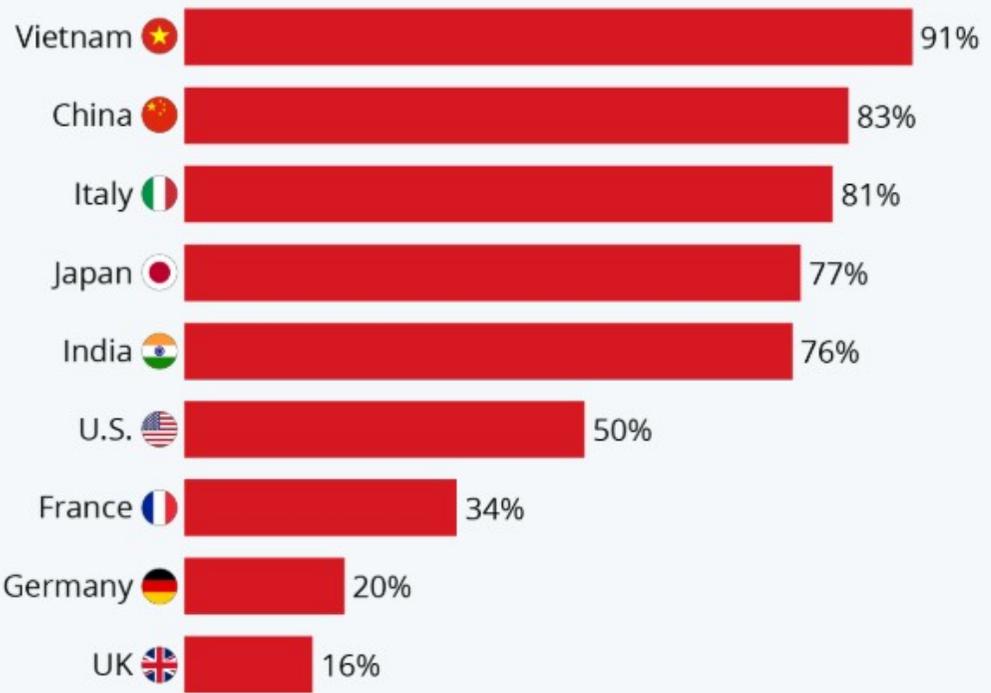
 Can cause large outbreaks quickly, so even 1 missed case can significantly undermine control efforts

## Challenges:

- Addressing the workforce gap (skills training, hiring authority and funding, workforce management, etc.)
- Technologies and applications
- National, state, and local coordination

# Adherence to Control Measures

Share of respondents from selected countries saying they wore face mask because of the coronavirus outbreak

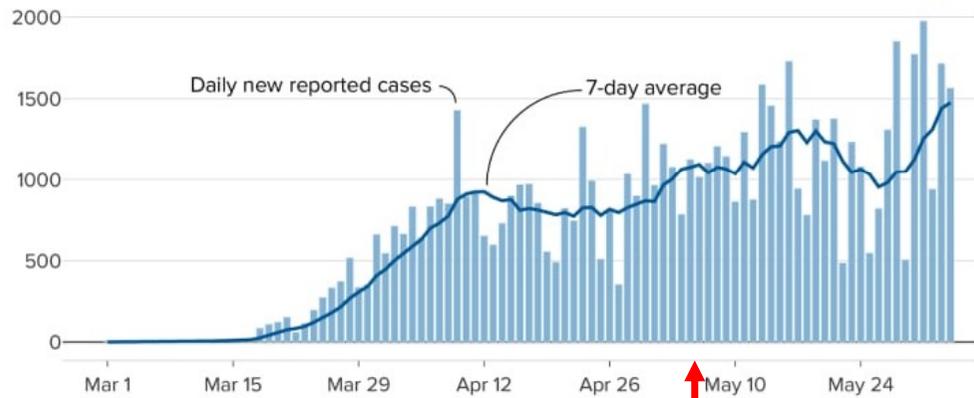


Survey of 28,000 people 16-74 years-old in 15 countries, April 9-12, 2020  
Source: Ipsos



# Implications of Re-opening Too Soon

## Daily new coronavirus cases in Texas



SOURCE: CNBC analysis of data from Johns Hopkins University. Data through June 3, 2020.



State re-opened

## Daily new coronavirus cases in Arizona



SOURCE: CNBC analysis of data from Johns Hopkins University. Data through June 3, 2020.



State re-opened

# Outline

- Global and local update
- Disparities in impact of COVID-19
- Responding to the COVID-19 epidemic
  - Challenges
  - **Successes**
- Spillover effect of COVID-19
- Summary

# Promotion of Public Health Measures

**STOP THE SPREAD OF GERMS**  
Help prevent the spread of respiratory diseases like COVID-19.

Cover your cough or sneeze with a tissue, then throw the tissue in the trash and wash your hands.



[cdc.gov/coronavirus](https://www.cdc.gov/coronavirus)

©2020 May 12, 2020/19

**STOP THE SPREAD OF GERMS**  
Help prevent the spread of respiratory diseases like COVID-19.

Stay at least 6 feet (about 2 arms' length) from other people.

6 ft



[cdc.gov/coronavirus](https://www.cdc.gov/coronavirus)

©2020 May 12, 2020/19

**Cloth Face Covering Do's & Don'ts:**

**DO:**

- ✓ Make sure you can breathe through it
- ✓ Wear it whenever going out in public
- ✓ Make sure it covers your nose and mouth
- ✓ Wash after using

**DON'T:**

- ✗ Use on children under age 2
- ✗ Use surgical masks or other personal protective equipment (PPE) intended for healthcare workers



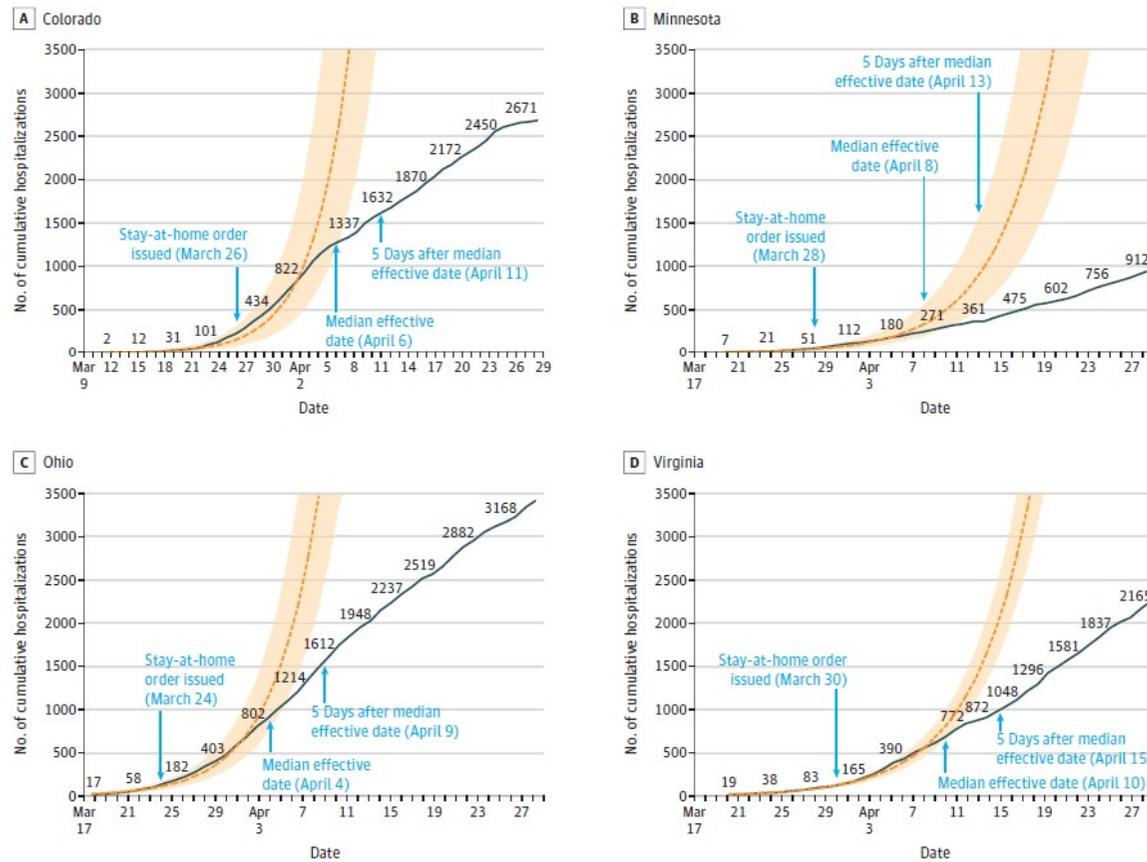
[cdc.gov/coronavirus](https://www.cdc.gov/coronavirus)

©2020 May 12, 2020/19

Source: US CDC

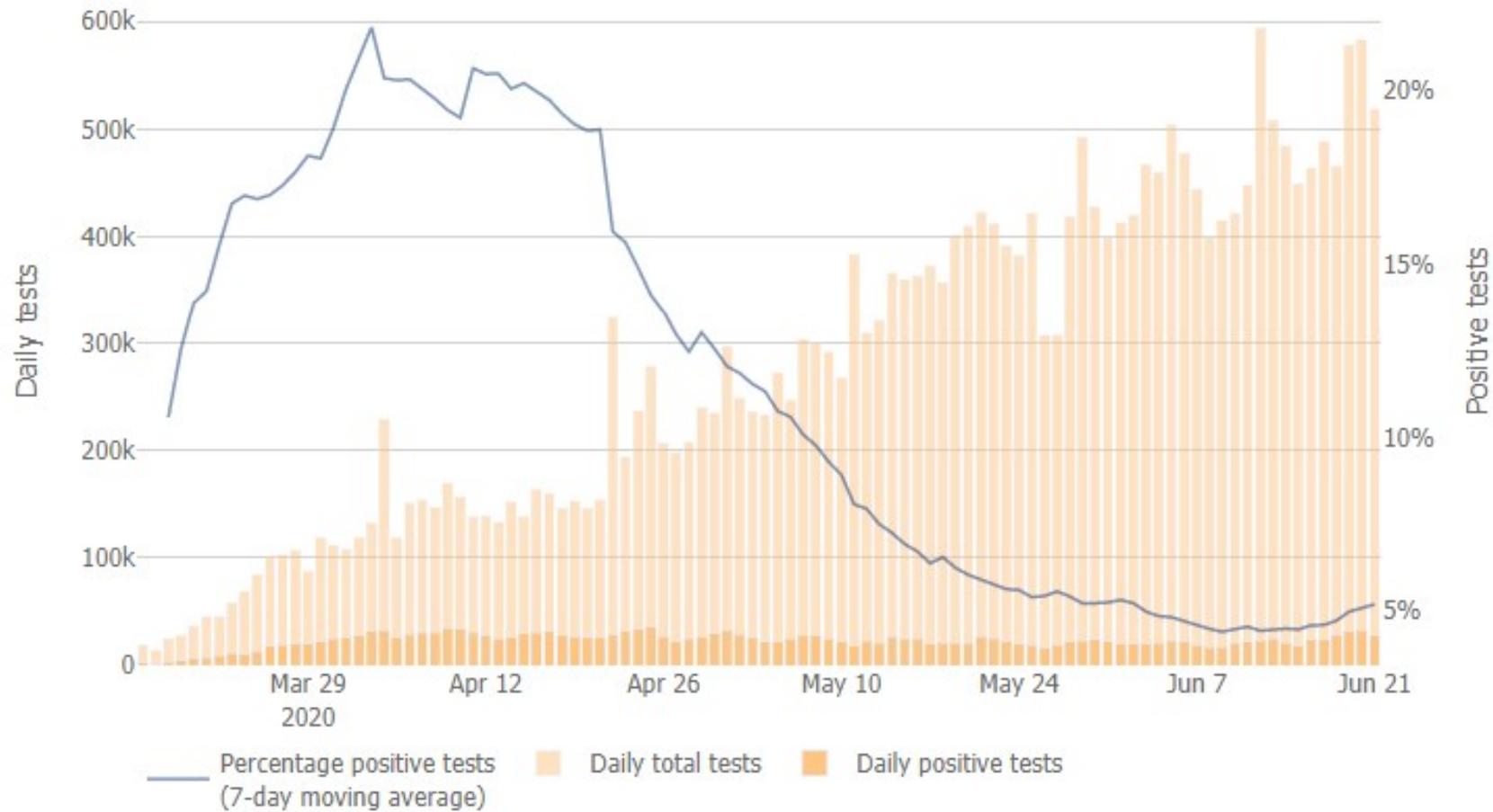
# Hospitalizations before and after stay-at-home orders

Figure. Projected vs Observed COVID-19 Hospitalizations Before and After Stay-at-Home Orders, March 10 Through April 28, 2020



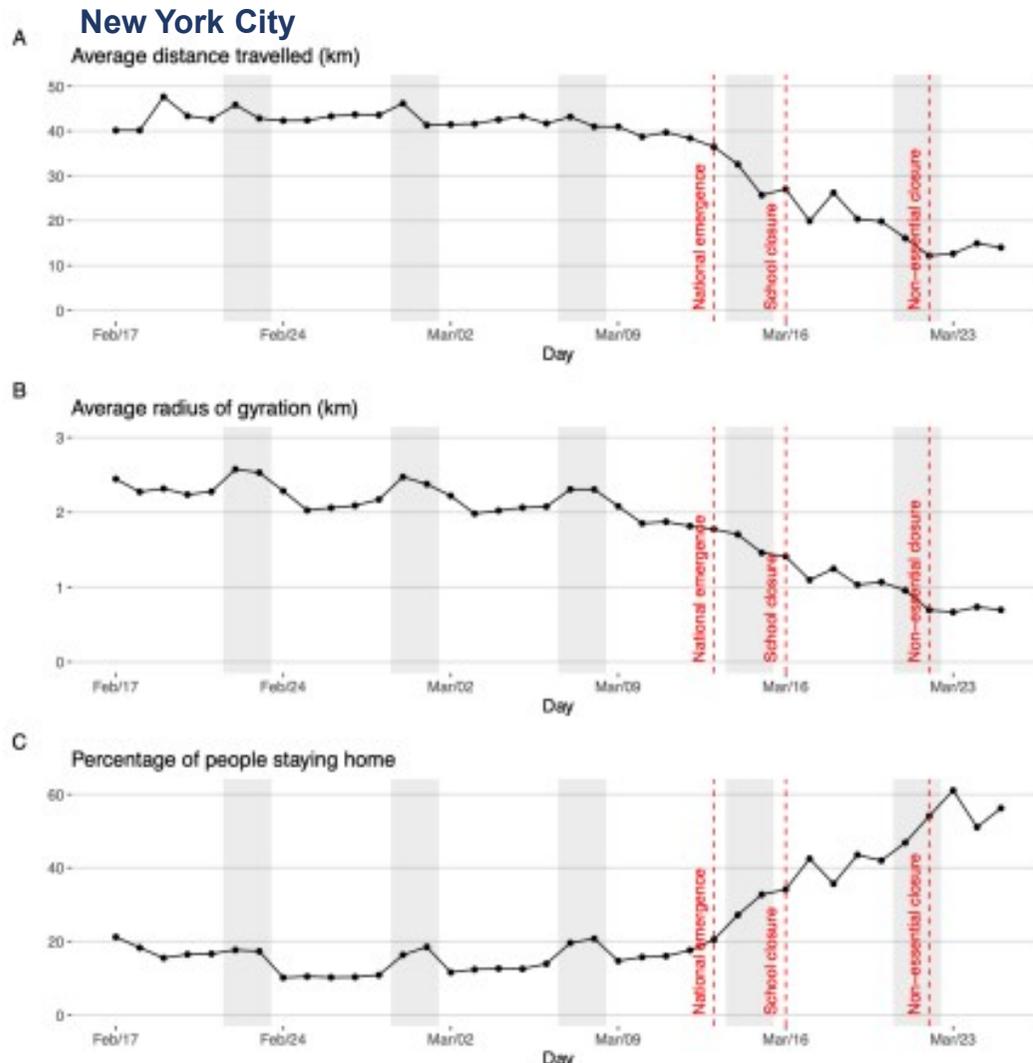
Sen et al, JAMA 2020

# Testing and diagnostic capacity

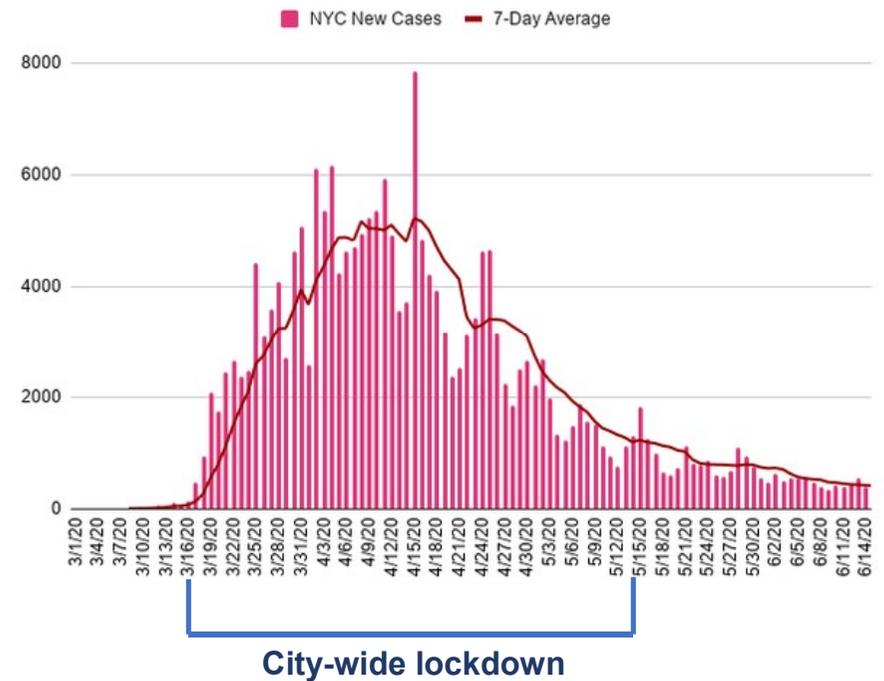


Source: COVID Tracking Project

# Social distancing measures



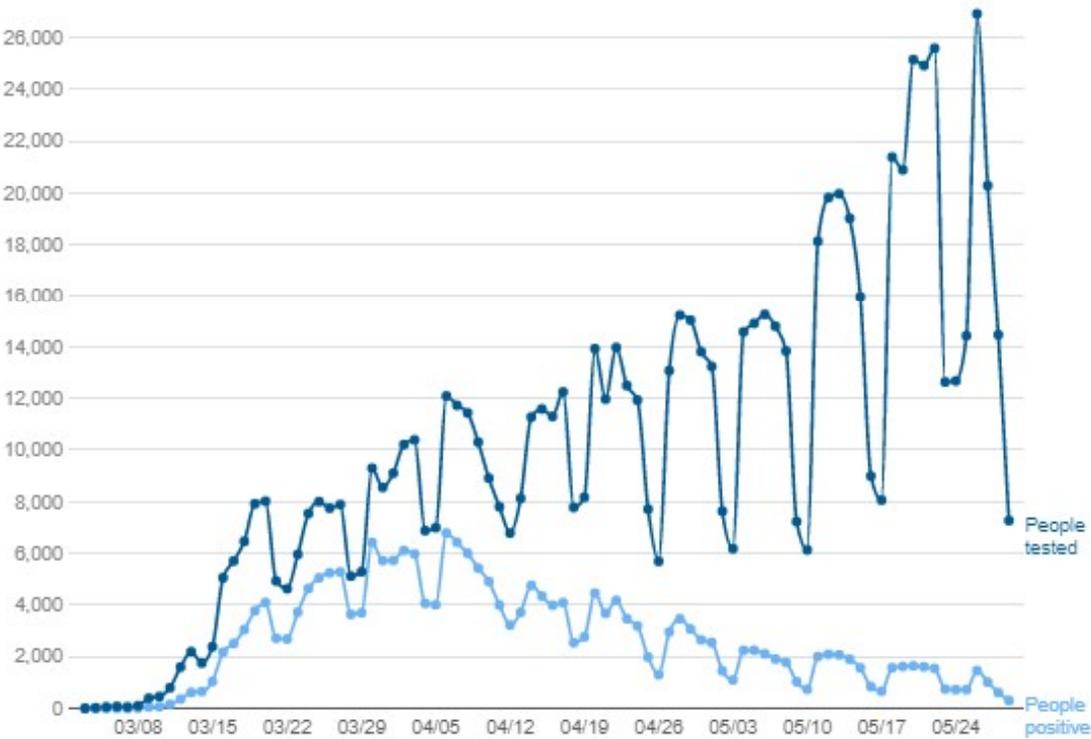
New York City New Cases



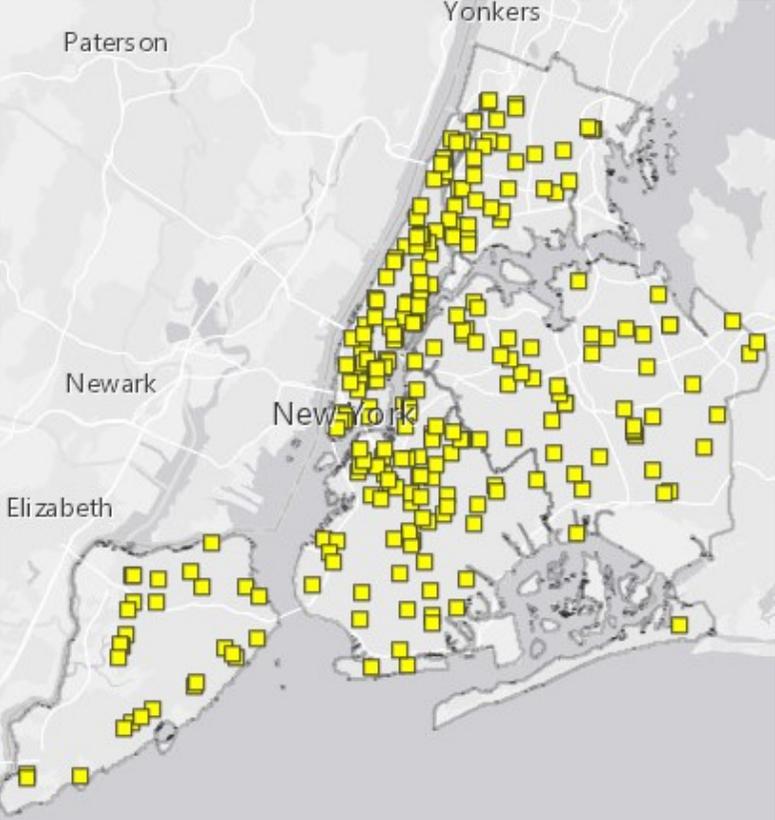
Sources: NYC Dept. of Health/ Gothamist, Bakker et al, MIT Connection Science

# Scale-Up of Testing in NYC

## Daily Testing in NYC



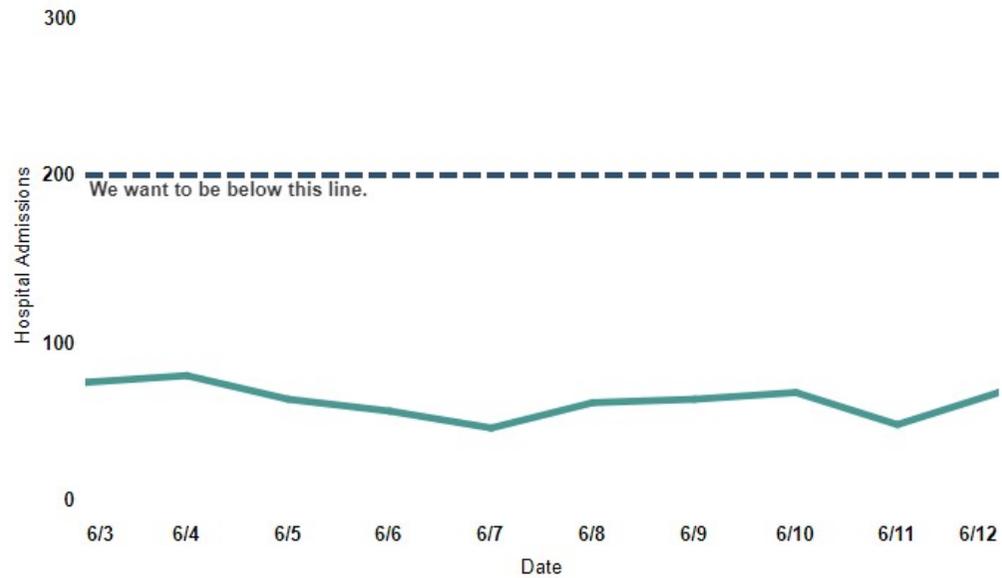
## Testing Sites in NYC



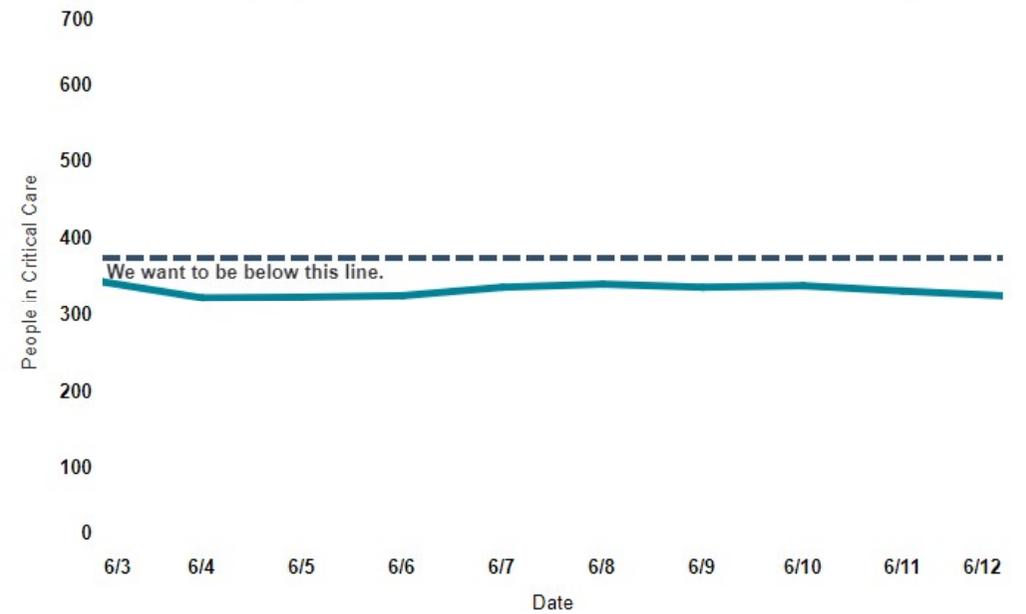
Source: New York City Dept. of Health and Mental Hygiene

# Milestones reached in NYC

## Daily number of people admitted to NYC hospitals for COVID-19-like illness



## Daily number of people in critical care across NYC Health + Hospitals

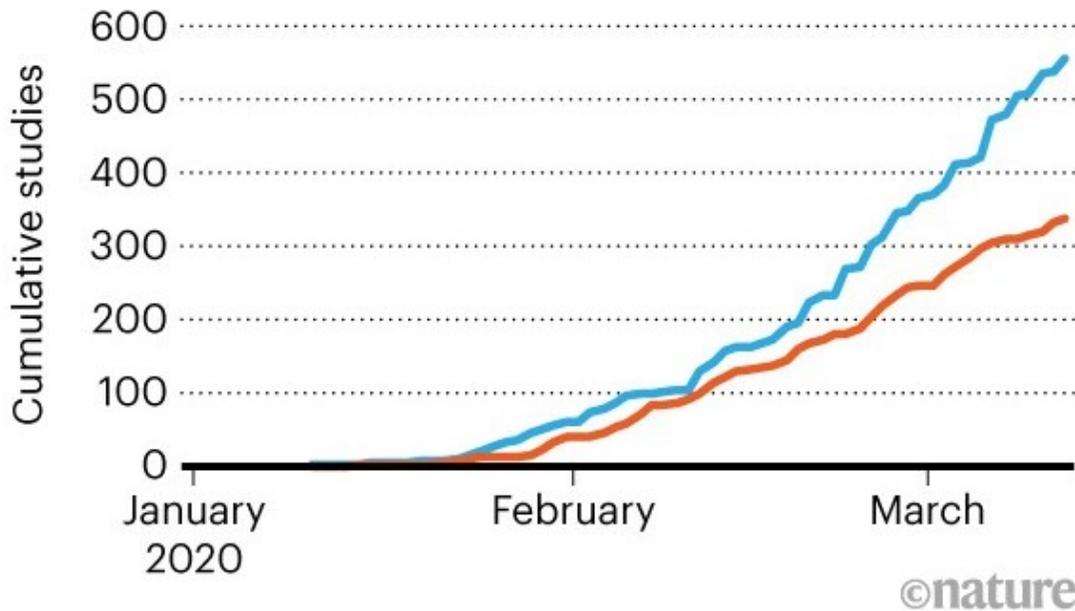


# Record-speed research

## CORONAVIRUS RESEARCH

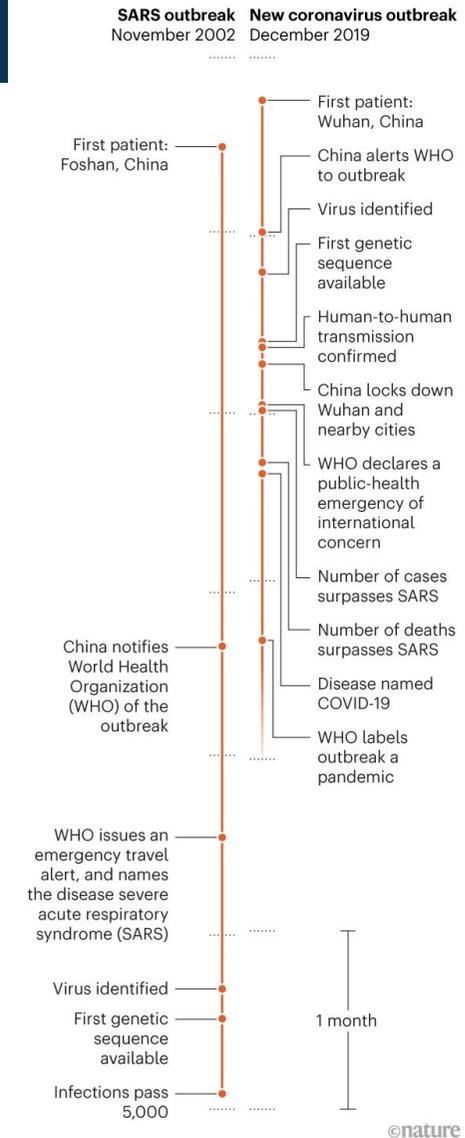
Hundreds of studies about the virus have been published since the outbreak began.

— Journal articles — Preprints



## CORONAVIRUS TIMELINE

Both SARS and COVID-19 emerged in China, but authorities have been faster to respond to the latest outbreak.

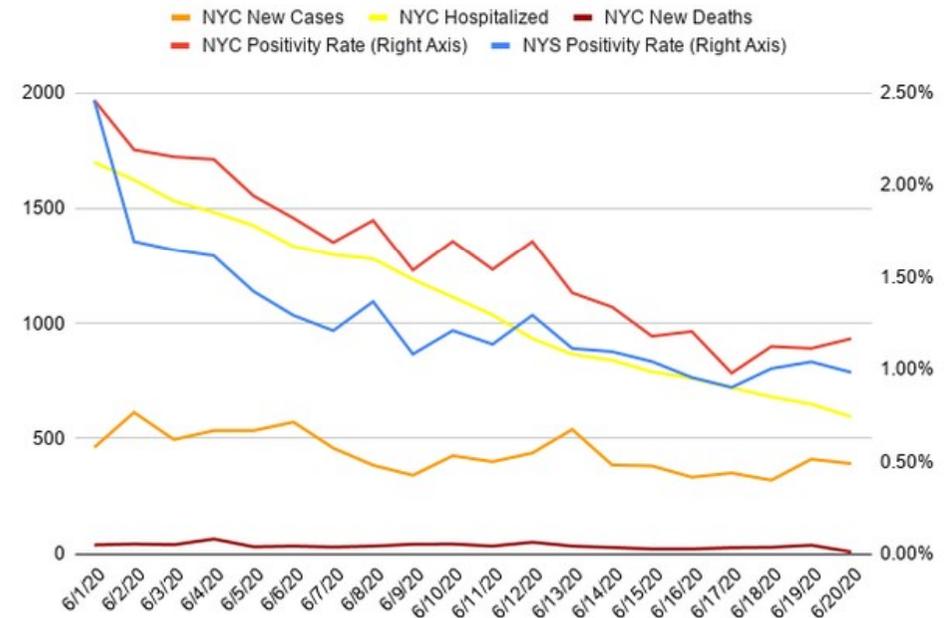


# Data-driven re-opening

<b>New York State Early Warning Criteria</b>	6/15	6/16	6/17	6/18	6/19	6/20	6/21
More than 8999 tests for city per day?	26539	27877	28801	29375	30540	31017	31847
More than 2519 tracers for city?	4648	4648	4648	4648	4648	4648	4648
Percent of tests positive less than 5%?*	1.6%	1.5%	1.4%	1.3%	1.3%	1.2%	1.2%
New cases per 100K population less than 10?*	4.94	4.93	4.80	4.67	4.62	4.37	4.37
New hospitalizations per 100K population under 2?*	0.93	0.89	0.89	0.88	0.84	0.84	0.79
Hospital beds available greater than 30%?*	29%	29%	29%	29%	29%	29%	29%
ICU beds available greater than 30%?*	33%	33%	34%	34%	34%	34%	34%
<b>New York City Milestone Criteria</b>	6/15	6/16	6/17	6/18	6/19	6/20	6/21
Hospital admissions under 200 per day?	51	53	50	56	64	65	75
Fewer than 375 critical cases at public hospitals?	324	334	333	320	315	313	309
Percent of tests positive less than 15%?	3%	2%	2%	2%	2%	2%	2%

Notes: the city and state appear to be using different methods to calculate percent of tests positive. \* = 7-day average.

### Early Warning Trends in New York



# Outline

- Global and local update
- Disparities in impact of COVID-19
- Responding to the COVID-19 epidemic
  - Challenges
  - Successes
- **Spillover effect of COVID-19**
- Summary

# Spillover effect of COVID-19 on global health

1.4 million additional TB deaths by 2025

**Tuberculosis**

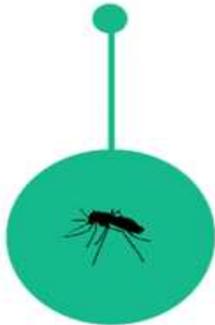


**HIV**

673,000 additional HIV-related deaths in Africa in 2020

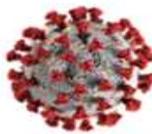
382,000 additional malaria deaths in 2020

**Malaria**



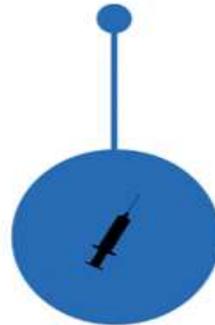
**Maternal & Child Health**

2.3 million child deaths and 113,000 maternal deaths over 12 months



80 million children at risk of vaccine-preventable diseases

**Routine Immunisation**



**Non-Communicable Diseases**

Cancer treatment disrupted in 42% of countries

Up to 15 million unintended pregnancies

**Reproductive Health**

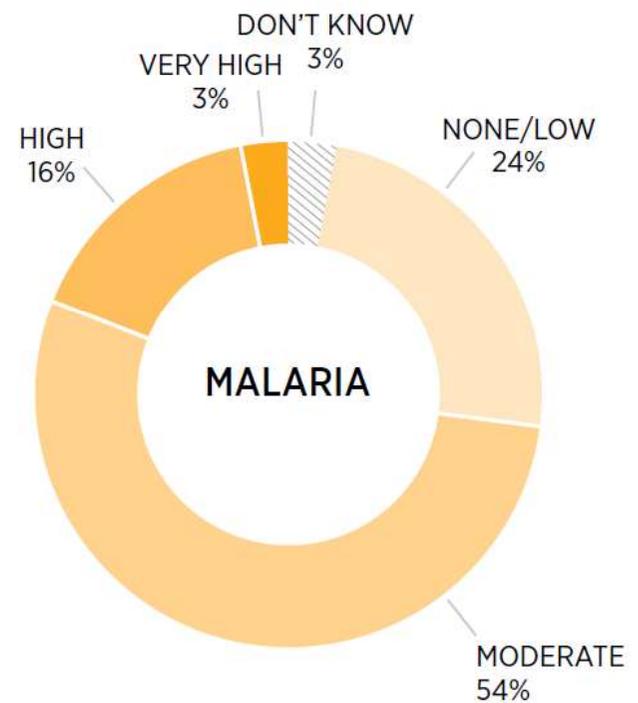
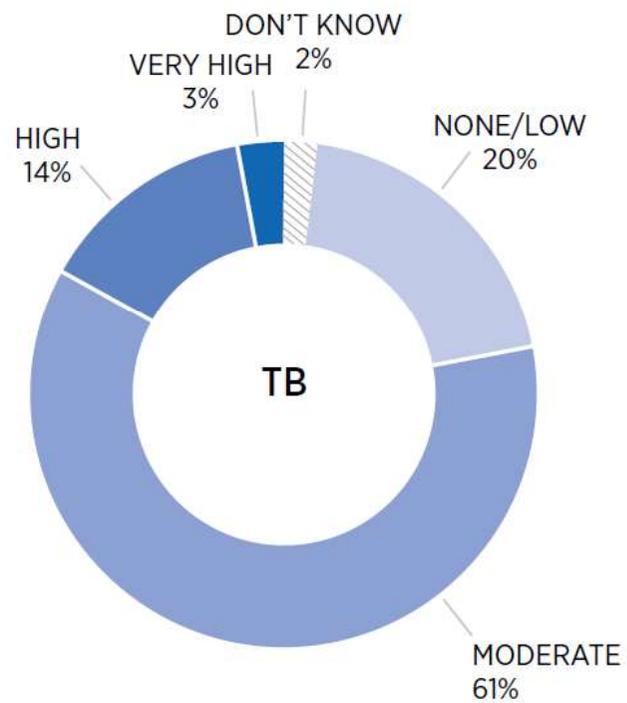
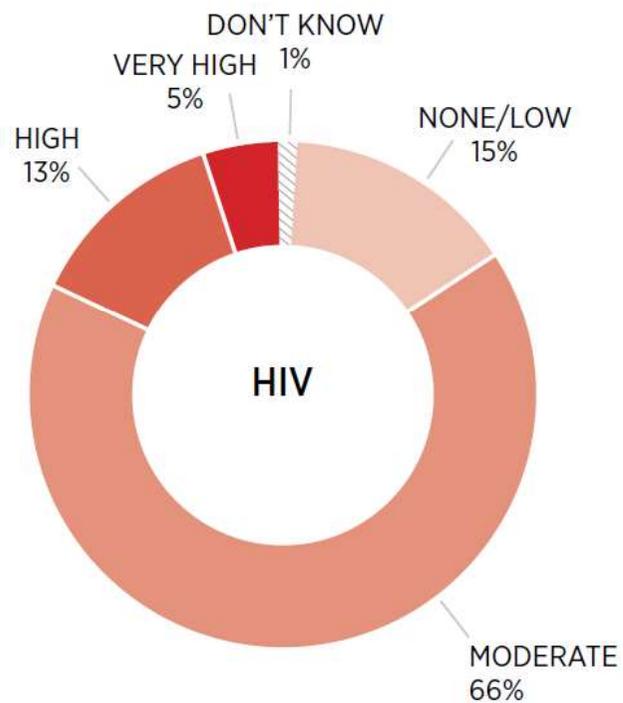


**Poverty**

Deepest global recession since World War II

Graphic credit: Jacob Bigio

# Disruption of Health Service Delivery



Global Fund, 2020

## Lessons learned from HIV

- Leadership and political will
- Myths and misconceptions
- Tackling stigma
- Engagement of affected communities
- Adherence to proven interventions
- Investment in health systems
- Data to inform action

# Summary

- The COVID-19 pandemic continues to expand and evolve
- Specific populations are disproportionately affected, both in terms of burden of disease and burden of complications
- Response to any outbreak/epidemic requires an ordered approach with frequent communication by trusted spokespersons
- Challenges and successes have been experienced in responding to the pandemic
- Investment is necessary in both public health as well as in health system in order to effectively respond to an epidemic
- Many lessons learned from the HIV response that can guide us moving forward as we face COVID-19